

1 IN THE UNITED STATES DISTRICT COURT  
2 FOR THE EASTERN DISTRICT OF TEXAS  
3 MARSHALL DIVISION

4 OPTIS WIRELESS TECHNOLOGY, ) ( CIVIL ACTION NO.  
5 LLC, OPTIS CELLULAR ) ( 2:19-CV-66-JRG  
6 TECHNOLOGY, LLC, PANOPTIS ) (  
7 PATENT MANAGEMENT, LLC, ) (  
8 UNWIRED PLANET, LLC, UNWIRED ) (  
9 PLANET INTERNATIONAL LIMITED, ) (  
10 PLAINTIFFS, ) (  
11 VS. ) (  
12 ) ( MARSHALL, TEXAS  
13 ) ( AUGUST 7, 2020  
14 APPLE INC., ) ( 8:22 A.M.  
15 DEFENDANTS. ) (  
16

17 TRANSCRIPT OF JURY TRIAL

18 MORNING SESSION

19 BEFORE THE HONORABLE JUDGE RODNEY GILSTRAP

20 UNITED STATES CHIEF DISTRICT JUDGE

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(Proceedings recorded by mechanical stenography, transcript  
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## P R O C E E D I N G S

(Jury out.)

COURT SECURITY OFFICER: All rise.

THE COURT: Be seated, please.

Are the parties prepared to read into the record those items from the list of pre-admitted exhibits used during yesterday's portion of the trial?

MR. MUELLER: Yes, we are, Your Honor.

MS. SCHUETZ: Yes, Your Honor.

THE COURT: Please proceed.

MS. SCHUETZ: Good morning, Your Honor.

Plaintiffs yesterday did not use any additional exhibits from the pre-admitted list. However, we do have one transcription error to correct, and that is on -- PX-5289a is in the transcript, but it should be PX-5279a.

THE COURT: Do Defendants agree with that?

MR. MUELLER: That's fine, Your Honor.

THE COURT: Then I'll take it that there's no objection, and I'll order the correction.

MS. SCHUETZ: That's all from Plaintiffs.

THE COURT: Let me hear from Defendant, please.

MR. MUELLER: Thank you, Your Honor. Our list today is DTX-26, DTX-82, DTX-83, DTX-102, DTX-106, DTX-115, DTX-119, DTX-154, DTX-171, DTX-417, DX-428, DTX-633, DTX-1047, DTX-1717, DTX-1904, DTX-1924, DTX-1931, DTX-1932,

08:29:34 1 DTX-1947, PX-63, PX-1571, and PX-1990.

08:29:48 2 THE COURT: All right. Is there an objection to  
08:29:49 3 that rendition from the Plaintiffs?

08:29:52 4 MS. SCHUETZ: Your Honor, there were a few  
08:29:54 5 exhibits that he listed that we did not have on our list as  
08:29:58 6 being agreed to. I don't know if this is because they were  
08:30:01 7 already pre-admitted and read into the record yesterday or  
08:30:03 8 the day before or if there is a dispute that I was not  
08:30:06 9 aware of.

08:30:06 10 THE COURT: Why do you not know? Why have you not  
08:30:10 11 discussed it with the other side? Why am I hearing about  
08:30:13 12 this from the podium for the first time in the courtroom?

08:30:16 13 MS. SCHUETZ: We have a list of exhibits that were  
08:30:19 14 agreed to between the parties -- yeah. Okay. So he is  
08:30:21 15 nodding now that they were already admitted and read into  
08:30:24 16 the record yesterday so --

08:30:25 17 THE COURT: All right. Then I gather we don't  
08:30:28 18 have any objection.

08:30:28 19 MS. SCHUETZ: No objection, Your Honor.

08:30:29 20 THE COURT: All right. Thank you.

08:30:30 21 All right. We ended yesterday with Dr. Buehrer.  
08:30:36 22 And who will Defendants' next witness be?

08:30:39 23 MR. MUELLER: Dr. Jonathan Wells, Your Honor.

08:30:42 24 THE COURT: And are you prepared to call Dr. Wells  
08:30:46 25 at this time?

08:30:46 1 MR. MUELLER: We are, Your Honor.

08:30:47 2 THE COURT: Then would you please bring in the  
08:30:49 3 jury, Mr. Elliott?

08:30:51 4 COURT SECURITY OFFICER: All rise.

08:31:10 5 (Jury in.)

08:31:12 6 THE COURT: Welcome back, ladies and gentlemen.  
08:31:15 7 Please have a seat.

08:31:16 8 If you'll notice the clock in the courtroom, it is  
08:31:21 9 exactly 8:30, so it took me a week to get there.

08:31:23 10 All right. We'll proceed with the Defendant's  
08:31:26 11 case-in-chief.

08:31:26 12 Defendants, call your next witness.

08:31:30 13 MR. MUELLER: Your Honor, we call Dr. Jonathan  
08:31:32 14 Wells to the stand.

08:31:33 15 THE COURT: All right. Dr. Wells, if you'll come  
08:31:37 16 forward and be sworn, please.

08:31:41 17 (Witness sworn.)

08:31:42 18 THE COURT: Please come around, sir. Have a seat  
08:31:51 19 on the witness stand.

08:31:55 20 All right. Mr. Mueller, you may begin with your  
08:32:11 21 direct examination.

08:32:12 22 MR. MUELLER: Thank you, Your Honor.

08:32:14 23 Good morning, ladies and gentlemen.

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08:32:14 1 JONATHAN WELLS, PH.D., DEFENDANT'S WITNESS, SWORN

08:32:14 2 DIRECT EXAMINATION

08:32:14 3 BY MR. MUELLER:

08:32:16 4 Q. And good morning, Dr. Wells.

08:32:18 5 A. Good morning, Mr. Mueller.

08:32:20 6 Q. Sir, could you please introduce yourself to the jury?

08:32:23 7 A. Certainly, yes.

08:32:24 8 Good morning, everybody. My name is Jonathan  
08:32:26 9 Wells. I'm a wireless communications consultant. I've  
08:32:30 10 been happily married for 22 years. I live in California  
08:32:32 11 with my wife and two teenage daughters.

08:32:36 12 THE COURT: Dr. Wells, pull the microphone a  
08:32:38 13 little closer to you, please, sir.

08:32:40 14 THE WITNESS: Yes, Your Honor.

08:32:41 15 THE COURT: Thank you.

08:32:41 16 Q. (By Mr. Mueller) Dr. Wells, what do you do for a  
08:32:45 17 living?

08:32:46 18 A. So I have my own consulting company. I'm a wireless  
08:32:50 19 communications consultant.

08:32:51 20 Q. And what type of consulting do you do?

08:32:52 21 A. So I work in the area of wireless communications,  
08:32:56 22 cellular communications, WiFi communications, but I do a  
08:32:59 23 lot of work on LTE.

08:33:00 24 MR. MUELLER: And if we could please pull up

08:33:03 25 DDX-6.2.

08:33:04 1 Q. (By Mr. Mueller) And, sir, could you tell us a bit  
08:33:07 2 about your background?

08:33:08 3 A. Yes, certainly. So -- excuse me.

08:33:12 4 This slide gives a little bit of background, a  
08:33:15 5 little bit of overview to myself.

08:33:17 6 Q. And why don't you tell us your educational background,  
08:33:20 7 if you could, sir?

08:33:20 8 A. So I have a Bachelor of Science and a Ph.D., both from  
08:33:25 9 the University of Bath in England. I then have an MBA  
08:33:28 10 degree, as well -- that's a business degree -- which I got  
08:33:32 11 when I was living in New Zealand.

08:33:34 12 Q. And, sir, what did you do after you went to college and  
08:33:38 13 earned your Ph.D.?

08:33:39 14 A. So after my Ph.D., I spent about two and a half years  
08:33:43 15 at the University of Bath. I was teaching. I was doing  
08:33:45 16 research. I was on the path to becoming a lecturer,  
08:33:49 17 becoming a professor.

08:33:50 18 But I realized I liked making things, I liked  
08:33:53 19 doing things, and so I made the conscious decision to leave  
08:33:56 20 university and to go out into industry.

08:33:58 21 Q. And what did you do in the industry?

08:34:00 22 A. So I worked for a variety of companies in England, New  
08:34:04 23 Zealand, and in the United States, as well. I came to the  
08:34:07 24 States in 1998. I worked for a variety of small/medium  
08:34:10 25 size companies. Some of them grew quite large, but they



08:34:14 1 were always in the area of wireless communications.

08:34:16 2 Q. And could you give us a couple of examples?

08:34:20 3 A. Yes, certainly. So one of the reasons I moved to New  
08:34:22 4 Zealand was there was a very small startup company there  
08:34:26 5 called MAS Technology. And we grew very large. We did a  
08:34:27 6 NASDAQ IPO, and we were eventually acquired by a large  
08:34:30 7 company in the U.S.

08:34:31 8 And then actually after that, I got transferred  
08:34:33 9 out to the U.S. here, and I started working here in the  
08:34:36 10 U.S. in 1998.

08:34:37 11 Q. Now, have you designed or built any products over the  
08:34:42 12 years?

08:34:43 13 A. I -- I have. I've -- I've been building products now  
08:34:46 14 for 30 years. I've built a variety of wireless products,  
08:34:50 15 and -- and many of my products have actually been used in  
08:34:53 16 the LTE systems.

08:34:54 17 Q. Have you written any books or publications?

08:34:57 18 A. I have. I have about 40 publications, conference  
08:35:01 19 presentations, all in the area of wireless communications.  
08:35:03 20 I've also written a textbook on high data rate millimeter  
08:35:08 21 wave communications. This is basically -- you may have  
08:35:10 22 heard the term "5G" --

08:35:10 23 THE COURT: Dr. Wells, could you slow down just a  
08:35:13 24 little bit, please?

08:35:14 25 THE WITNESS: I apologize, Your Honor.

08:35:14 1 THE COURT: Please try to speak slower.

08:35:17 2 THE WITNESS: Certainly, Your Honor.

08:35:19 3 A. I was just going to say this that this is the basis of  
08:35:22 4 5th generation of cell phones. I wrote a textbook about  
08:35:26 5 that.

08:35:27 6 Q. (By Mr. Mueller) Are you a named inventor on any  
08:35:28 7 patents?

08:35:29 8 A. I am. I have a number of patents. I think it's five  
08:35:33 9 patents and patent applications that have my name on them.

08:35:36 10 Q. And are you a member of any professional organizations?

08:35:40 11 A. I am. I'm a member of the IEEE. That's the Institute  
08:35:44 12 of Electrical and Electronics Engineers. I was elected a  
08:35:47 13 senior member back in 1999.

08:35:48 14 Q. And, sir, have you received any awards from the IEEE?

08:35:51 15 A. Yes. Yes, I have. Last -- last year, the Santa Clara  
08:35:56 16 Valley -- basically the Silicon Valley group of the IEEE,  
08:36:00 17 they awarded me their 2019 Engineer of the Year award.

08:36:04 18 Q. Now, sir, have you participated in any  
08:36:08 19 standards-setting organizations?

08:36:09 20 A. Yes, yes, I -- I have. I've been a member of both 3GPP  
08:36:14 21 and ETSI. I've actually been to a number of ETSI meetings.  
08:36:21 22 I've written contributions for ETSI. I've helped write  
08:36:26 23 ETSI specifications. These were all for the  
08:36:31 24 telecommunication space. So I've had a lot of experience  
08:36:33 25 with ETSI.

08:36:33 1 Q. And you're familiar with ETSI's practices and  
08:36:36 2 procedures?

08:36:36 3 A. I am, through not only my actual -- going to these  
08:36:40 4 meetings but through reading their minutes and working  
08:36:45 5 closely with their specifications.

08:36:46 6 Q. Now, are you also familiar with an organization called  
08:36:49 7 3GPP?

08:36:49 8 A. Yes, I am.

08:36:51 9 Q. What is that?

08:36:52 10 A. So 3GPP is the Third Generation Partnership Project.  
08:36:58 11 I've been a member of 3GPP. I've never actually gone to  
08:37:01 12 any of their meetings, but I use their specifications every  
08:37:04 13 day in my -- my work.

08:37:05 14 Q. And what materials are generated as part of the 3GPP  
08:37:10 15 process?

08:37:10 16 A. There's -- there's a lot of information generated at  
08:37:16 17 these meetings which are held about once every month.  
08:37:20 18 There's a lot of contributions, technical contributions.  
08:37:23 19 These -- these are discussed at the meetings. Minutes are  
08:37:28 20 kept. The emails between members are all kept, and all of  
08:37:33 21 these are published. They're all online, available to  
08:37:35 22 download free of charge, not even password protected.

08:37:38 23 So there's a lot of 3GPP information, in addition  
08:37:42 24 to the specifications that we've been talking about here.

08:37:44 25 Q. Now, sir, we've heard a lot at this trial about LTE.

08:37:48 1 What is your experience with the LTE standard?

08:37:53 2 A. So with the LTE standard and the specifications around  
08:37:55 3 it, I -- I use them every day in my job. I've been using  
08:37:59 4 them for a number of years now. As a consultant in this  
08:38:03 5 area, this is really my -- my bible, if you like. This is  
08:38:06 6 what I -- I use in my work every day.

08:38:10 7 MR. MUELLER: Your Honor, at this point, we ask  
08:38:13 8 that Dr. Wells be recognized as an expert in wireless  
08:38:17 9 technology, standard-setting practicing -- practices and  
08:38:21 10 procedures, including in the context of ETSI and 3GPP.

08:38:25 11 THE COURT: Is there objection?

08:38:25 12 MR. SHEASBY: No objection, Your Honor.

08:38:27 13 THE COURT: Then without objection, the Court will  
08:38:29 14 recognize this witness as an expert in those designated  
08:38:32 15 fields.

08:38:32 16 Please continue.

08:38:34 17 MR. MUELLER: Thank you, Your Honor.

08:38:34 18 Q. (By Mr. Mueller) Dr. Wells, what have you been asked  
08:38:36 19 to do in this case?

08:38:37 20 A. So I've been asked to look at two patents in this case,  
08:38:41 21 what's called the '774 and the '558 patent and '553 patent,  
08:38:47 22 and I've been asked to form an opinion as to whether the  
08:38:50 23 Apple products infringe these patents and whether these  
08:38:53 24 patents are valid or not.

08:38:54 25 Q. And at a high level, what conclusions have you reached,

08:38:57 1 sir?

08:38:57 2 A. So my -- my opinion is that for -- for both of these  
08:39:00 3 patents, that the Apple products do not infringe the  
08:39:05 4 patents and that to the extent that the Plaintiffs have  
08:39:09 5 applied the meaning very broadly of these patents, under  
08:39:12 6 those conditions the patents would be invalid.

08:39:16 7 MR. MUELLER: Let's take a look at DDX-6.3,  
08:39:20 8 please.

08:39:20 9 Q. (By Mr. Mueller) And, sir, what materials have you  
08:39:23 10 considered for your work on this case?

08:39:24 11 A. So I've considered a wide variety of materials, which  
08:39:28 12 are listed on this page here. I won't go through all of  
08:39:32 13 them, but I've looked through the patents themselves and  
08:39:34 14 their file histories.

08:39:35 15 The file history is really the correspondence that  
08:39:38 16 goes on between the people applying for a patent and the  
08:39:42 17 Patent Office.

08:39:43 18 I've used the Court's claim construction order.  
08:39:45 19 I've looked at Apple technical specifications. I've  
08:39:48 20 listened to deposition testimony and actually talked with  
08:39:51 21 Apple engineers. I've looked at the Qualcomm and Intel  
08:39:55 22 source code and documentation in this case, as well, and a  
08:39:59 23 variety of other things, including the specifications  
08:40:01 24 themselves, licenses, and all sorts of discovery documents  
08:40:06 25 that were produced in this case.

08:40:07 1 Q. Now, sir, for your work on this case, have you been  
08:40:11 2 compensated at your normal consulting rate?

08:40:14 3 A. Yes, I have.

08:40:14 4 Q. And what is that rate?

08:40:15 5 A. My rate is \$600 an hour.

08:40:17 6 Q. And, sir, have you ever been retained for any projects  
08:40:21 7 by Apple before this case?

08:40:22 8 A. Yes, I have.

08:40:23 9 Q. Are you here, sir, as an independent expert?

08:40:25 10 A. That is correct. I'm here as an independent expert.

08:40:28 11 Q. And is any of your compensation tied in any way  
08:40:33 12 whatsoever to what the ladies and gentlemen of the jury  
08:40:35 13 decide?

08:40:36 14 A. None whatsoever.

08:40:36 15 Q. Let's turn to the '774 patent if we could, is that  
08:40:42 16 okay, sir?

08:40:42 17 A. Excuse me.

08:40:43 18 Q. Take your time. Dr. Wells, may we turn to the '774  
08:40:52 19 patent?

08:40:52 20 A. Yes, certainly.

08:40:53 21 MR. MUELLER: Let's go to DDX-6.5, please.

08:40:57 22 Q. (By Mr. Mueller) And this is one of the two patents  
08:40:59 23 you've worked on for this case, sir?

08:41:01 24 A. That is correct.

08:41:03 25 Q. Now, this is a patent that originated with Samsung. Do

08:41:07 1 I have that right, sir?

08:41:08 2 A. That is right.

08:41:10 3 Q. When did you first hear about this patent?

08:41:12 4 A. The first time -- first time I heard about this patent  
08:41:15 5 was when I was engaged by Apple about 14 months ago.

08:41:19 6 Q. Are you aware of any books or articles or other  
08:41:21 7 publications that discuss the substance of this patent?

08:41:24 8 A. No, I'm not.

08:41:25 9 Q. Now, at a high level, what does the patent relate to?

08:41:29 10 A. So the patent relates to receive -- how a -- a base  
08:41:35 11 station and a handset operate together, and particularly  
08:41:39 12 it's about how a handset receives data from a base station,  
08:41:43 13 in particular how it also receives what's called a  
08:41:46 14 processing parameter.

08:41:48 15 MR. MUELLER: Your Honor, may I approach the  
08:41:52 16 easel?

08:41:53 17 THE COURT: You may.

08:41:54 18 Q. (By Mr. Mueller) Sir, did you use the term "processing  
08:42:09 19 parameter"?

08:42:09 20 A. Yes, I did.

08:42:10 21 Q. Now, is that the key concept for the dispute between  
08:42:13 22 parties in this case on the '774 patent?

08:42:15 23 A. Yes, it is.

08:42:16 24 Q. What is a processing parameter?

08:42:18 25 A. The patent describes a processing parameter as one of a

08:42:23 1 time delay, a phase change, or a gain.

08:42:32 2 Q. Now, what Dr. Mahon, who is the Plaintiffs' expert for  
08:42:35 3 this patent, accusing in this of infringing the '774  
08:42:38 4 patent?

08:42:38 5 A. So Dr. Mahon accuses what's called receiving a DCI  
08:42:44 6 format 2 message.

08:42:45 7 MR. MUELLER: Let's go to DTX-83.

08:42:49 8 Q. (By Mr. Mueller) And, sir, this is also at Tab 2 in  
08:42:53 9 your binder, whatever is easier.

08:42:55 10 MR. MUELLER: But if we could put up DTX-83.

08:42:59 11 Q. (By Mr. Mueller) Do you recognize this, sir?

08:43:02 12 A. Yes.

08:43:02 13 Q. What is it?

08:43:02 14 A. So, DTX-83 is one of the 3GPP2 specifications. This  
08:43:07 15 one we refer to its number it at the top. We call it TS  
08:43:13 16 36.213.

08:43:15 17 Q. And, sir, if we could turn to 7.1.5 in Section 71.  
08:43:25 18 What do we see here?

08:43:26 19 A. So, within the specification here, there's a table of  
08:43:28 20 all the DCI formats that are actually used in this case,  
08:43:32 21 and you can see that there's a lot of different DCI formats  
08:43:39 22 that are allowed within LTE.

08:43:40 23 Q. And these are alternative formats, sir?

08:43:43 24 A. Yes, that's right. The accused is DCI format 2, but  
08:43:47 25 there's lots of other alternatives.



08:43:50 1 Q. What is Dr. Mahon's opinion -- does Dr. Mahon accuse of  
08:43:55 2 infringement format 2A, for example?

08:43:58 3 A. No, he doesn't. I've highlighted that in yellow.

08:44:03 4 Dr. Mahon doesn't -- does not accusing DCI format 2A of  
08:44:08 5 infringing.

08:44:08 6 Q. And how does format 2A compare to format 2 in terms of  
08:44:15 7 performance?

08:44:15 8 A. It's not too dissimilar. They're both for what we call  
08:44:18 9 spatial multiplexing. This is a technology whereby you can  
08:44:22 10 transmit from multiple antennas. You can do that in either  
08:44:24 11 DCI -- well, you can do that in either Mode 3 which uses  
08:44:29 12 DCI format 2A, or you can do it in Mode 4, which uses DCI  
08:44:35 13 DCI format 2.

08:44:36 14 Q. And was this format 2A available as an alternative at  
08:44:38 15 the time this standard was created?

08:44:38 16 A. Yes, that's right. This is the first release of this  
08:44:42 17 specifications that I've shown here. All of these DCI  
08:44:45 18 formats were available at that time.

08:44:47 19 Q. Now, Dr. Mahon says DCI format 2, as used in the  
08:44:52 20 Qualcomm and Intel chips, infringes. Do I have that right?

08:44:55 21 A. That's his opinion.

08:44:56 22 Q. Can we explore your analysis of his opinion?

08:45:01 23 A. Certainly.

08:45:02 24 MR. MUELLER: So let's go to DDX-6.7.

08:45:06 25 Q. (By Mr. Mueller) And what do we see here?

08:45:08 1 A. So this is Claim 6, which is the only asserted claim in  
08:45:12 2 this patent. And what I've done is I've highlighted the  
08:45:15 3 language "receiving a processing parameter."

08:45:18 4 Q. Do the Apple products in this case meet the requirement  
08:45:23 5 that you've highlighted?

08:45:24 6 A. No, they don't.

08:45:26 7 Q. Now, if you could read the full limitation there that  
08:45:29 8 starts "receiving a processing parameter" to us.

08:45:32 9 A. Yes. So it's -- it's: Receiving a processing  
08:45:35 10 parameter for transmission of data on two antenna ports,  
08:45:39 11 the processing parameter including at least one of a time  
08:45:43 12 delay, a phase rotation, and a gain determined based on a  
08:45:51 13 received uplink signal.

08:45:53 14 Q. Now, sir --

08:45:54 15 MR. MUELLER: Your Honor, may I approach the easel  
08:45:56 16 again?

08:45:56 17 THE COURT: You may.

08:45:57 18 Q. (By Mr. Mueller) Let's break this down if we could,  
08:46:06 19 Dr. Wells.

08:46:06 20 THE COURT: Can you see that?

08:46:07 21 THE WITNESS: Yes, yes, I can, Your Honor. Thank  
08:46:10 22 you.

08:46:10 23 THE COURT: All right.

08:46:10 24 Q. (By Mr. Mueller) Sir, here I've just -- I've put an  
08:46:13 25 iPhone. Do you see that, sir?

08:46:14 1 A. Yes, I do.

08:46:15 2 Q. And here we have the base station. Do you see that,  
08:46:22 3 sir?

08:46:22 4 A. Correct.

08:46:22 5 Q. To meet that claim requirement, what needs to be  
08:46:25 6 received by the iPhone from the base station?

08:46:30 7 A. The base station has to send a processing parameter.  
08:46:37 8 The receiver, the handset, has to receive the processing  
08:46:43 9 parameter as per I've got on the screen here.

08:46:44 10 Q. So, this processing parameter needs to go from the base  
08:46:50 11 station to the phone. Do I have that right?

08:46:52 12 A. That's correct. For the phone to receive the  
08:46:55 13 processing parameter, that is correct.

08:46:57 14 Q. What actually happens in the iPhone?

08:46:59 15 A. So what actually happens is the iPhone doesn't receive  
08:47:02 16 a processing parameter. In fact, quite the opposite  
08:47:05 17 happens. The iPhone computes a processing parameter  
08:47:08 18 itself.

08:47:09 19 Q. Now, sir, do you have an analogy for the jury to help  
08:47:13 20 with how the products work?

08:47:15 21 A. Yes, I do.

08:47:16 22 Q. And what is that analogy?

08:47:19 23 A. So the analogy I'd like to present to you is an analogy  
08:47:24 24 with a Lego model. The analogy that I've got is a child --  
08:47:29 25 this child likes playing with a Lego, it's their birthday,

08:47:33 1 and what they would like is a Lego house. Would you like  
08:47:37 2 me to play the animation?

08:47:39 3 Q. Yes, please. We'll go to the animation in a minute.  
08:47:42 4 But if you could just -- again, I want to keep you on the  
08:47:45 5 products, not the patent, but the products. How do the  
08:47:48 6 Legos compare to how the Apple products compute a  
08:47:51 7 processing parameter?

08:47:52 8 A. So in the analogy I'm going to show you, the -- the  
08:47:58 9 child himself or herself actually constructs the Lego house  
08:48:02 10 themselves. The child builds the Lego house. And this is  
08:48:07 11 how the pro -- this is how the Apple products actually  
08:48:09 12 work. The Apple products themselves compute a processing  
08:48:12 13 parameter. They don't receive it from the base station.

08:48:16 14 MR. MUELLER: So let's go through this  
08:48:18 15 piece-by-piece, and start with DTX-82.

08:48:29 16 Q. (By Mr. Mueller) Now, what is this, sir?

08:48:30 17 A. So here I have another 3GPP specification. This one we  
08:48:34 18 refer to as 36.212.

08:48:37 19 Q. And this is another portion of the LTE specification  
08:48:39 20 that you considered?

08:48:40 21 A. That's correct.

08:48:41 22 MR. MUELLER: Let's go to DTX-71.

08:48:47 23 Q. (By Mr. Mueller) What is this?

08:48:48 24 A. This is another LTE specification, 36.211.

08:48:53 25 Q. And why are these two specifications relevant to your

08:48:56 1 analysis?

08:48:56 2 A. So these are the two specifications that I used and  
08:48:58 3 Dr. Mahon used, but these two actually confirm and lay out  
08:49:02 4 the procedure that a device such as an iPhone would have to  
08:49:05 5 go through to compute a processing parameter.

08:49:08 6 Q. Now, sir, did you stop at the specification or did you  
08:49:10 7 actually look at the source code on the chips, too?

08:49:12 8 A. No, I actually looked at the source code that was on  
08:49:19 9 the chips.

08:49:19 10 Q. The Intel chips and the Qualcomm chips?

08:49:22 11 A. That's correct, for -- for both of those chips.

08:49:25 12 MR. MUELLER: Let's go to DTX-82 again and look at  
08:49:28 13 Section 5.3.1.1 and we can also put up DDX-6.14, if it's  
08:49:55 14 easier.

08:49:55 15 Q. (By Mr. Mueller) What do we see here?

08:49:56 16 A. So, the way the Apple products actually work is they go  
08:49:58 17 through a five-step procedure to compute the processing  
08:50:01 18 parameter. And this shows the very first step.

08:50:03 19 Q. What happens in the first step, sir?

08:50:06 20 A. In the very first step, the base stations sends down  
08:50:09 21 what they call a transport block CRC attachment that  
08:50:13 22 contains this parameter, the number of transmit antenna  
08:50:17 23 ports at the eNodeB.

08:50:19 24 Now, I understand that's rather complex. What  
08:50:23 25 this really means is that the base station sends an

08:50:25 1 indication to the phone about the number of transmitter --  
08:50:30 2 the number of antennas that it's transmitting.

08:50:33 3 MR. MUELLER: Let's go to DDX-6.15.

08:50:36 4 Q. (By Mr. Mueller) What do we see here?

08:50:42 5 A. So here is the second step in this five-step process  
08:50:45 6 that the Apple products go through, and this is the DCI  
08:50:49 7 format 2 message, which you can see at the top. But the  
08:50:52 8 Apple products will extract from that what they call  
08:50:55 9 precoding information, which I've highlighted in green at  
08:50:58 10 the bottom.

08:50:59 11 Q. This is the second step?

08:51:02 12 A. This is the second step.

08:51:04 13 MR. MUELLER: Sir, let's go to DDX6.16.

08:51:11 14 Q. (By Mr. Mueller) And what do we see here?

08:51:12 15 A. So this is the third step in the five-step process.  
08:51:16 16 Again, I'm looking at the DCI format 2 message, but I've  
08:51:21 17 highlighted in blue the calculations done third. There's a  
08:51:24 18 number of different information here, modulation and coding  
08:51:28 19 scheme, redundancy version. But essentially the device  
08:51:31 20 will take all of this information and it performs a  
08:51:34 21 calculation to determine whether there's what we call  
08:51:37 22 either one codeword or two codewords.

08:51:40 23 Q. And, again, remind us which step in the process are we  
08:51:45 24 at now?

08:51:45 25 A. So this is the third.

08:51:50 1 MR. MUELLER: Let's go to DDX-6.17.

08:51:54 2 Q. (By Mr. Mueller) What do we see here?

08:51:55 3 A. So, this -- this is the fourth step it goes through.

08:51:59 4 And what I'd like to show here is the Apple products will  
08:52:00 5 actually use the previous three steps.

08:52:02 6 They take the number of antenna ports, which they  
08:52:04 7 received in the first step, they take the precoding  
08:52:08 8 information, which I've highlighted in green, which they'll  
08:52:14 9 extract in the second step. They then take the number of  
08:52:20 10 codewords, which I talked about in the third step.

08:52:24 11 And then from all that information, that then  
08:52:26 12 enables them to pick a particular table, such as, for  
08:52:30 13 example, this one here, and from all of that, they're able  
08:52:34 14 to output two other variables.

08:52:38 15 The first variable, I put in red, is called the  
08:52:43 16 number of layers. And the second variable, which I've put  
08:52:46 17 in gray, is called a TPMI. This is the fourth step in that  
08:52:51 18 five-step process.

08:52:52 19 MR. MUELLER: Let's go to DDX-6.18.

08:52:55 20 Q. (By Mr. Mueller) And, sir, what do we see here?

08:52:58 21 A. So here we see the fifth and final step. What's  
08:53:02 22 happened here is that you take the number of antenna ports,  
08:53:09 23 which you received in the first step, you use the codebook  
08:53:12 24 index and the number of layers, which you've derived from  
08:53:16 25 that fourth step.

08:53:17 1 That enables you to then select a table like this,  
08:53:23 2 and then, from within that table, you can pick a  
08:53:26 3 particular -- for example, processing parameter.

08:53:28 4 Q. Now, we're at Step 5; is that right, sir?

08:53:35 5 A. That is correct.

08:53:36 6 Q. Are we now at the completion of this process?

08:53:39 7 A. That's right. So these are the five steps that the  
08:53:42 8 Apple products go through to compute the processing  
08:53:45 9 parameter.

08:53:45 10 Q. Now, sir, you have a green binder in front of you  
08:53:48 11 that's labeled source code. Could you just pull that in  
08:53:51 12 front of you if you get a chance?

08:53:53 13 A. Yes, I have it.

08:53:54 14 Q. And this includes several exhibits, DTX-1901, DTX-1904,  
08:54:03 15 DTX-1902, DTX-1898, and DTX-2018. Do you see those, sir?

08:54:10 16 A. Yes, I do.

08:54:11 17 Q. What are those?

08:54:12 18 A. These are -- these are the Intel and Qualcomm source  
08:54:19 19 code that I analyzed in this case.

REDACTED BY ORDER OF THE COURT

08:54:20 20 Q. [REDACTED]

08:54:23 21 [REDACTED]

08:54:27 22 [REDACTED]

08:54:35 23 [REDACTED]

08:54:38 24 [REDACTED]

08:54:42 25 [REDACTED]



08:54:42 1

[REDACTED]

08:54:42 2

Q. That is Dr. Jones?

08:54:45 3

A. Mr. Jones, yes.

08:54:46 4

Q. Mr. Jones. I'm sorry. Mr. Jones.

08:54:47 5

A. Yes.

REDACTED BY ORDER OF THE COURT

08:54:48 6

Q. [REDACTED]

08:54:54 7

[REDACTED]

08:54:57 8

[REDACTED]

08:54:58 9

Q. Now, sir, let's go back to your analogy.

08:55:03 10

MR. MUELLER: And if we can put on the screen the

08:55:08 11

Legos.

08:55:09 12

Q. (By Mr. Mueller) Tell us how this compares to your

08:55:12 13

analogy.

08:55:12 14

A. Yes, certainly.

08:55:13 15

So in this analogy here, as I said, it's a child's

08:55:14 16

birthday. They would like a Lego house for their birthday.

08:55:17 17

So they eagerly await -- it's their birthday morning. They

08:55:21 18

await the arrival of the mailman. There's a package, and

08:55:26 19

inside it is a number of red bricks, yellow bricks, green

08:55:32 20

bricks.

08:55:32 21

Then what happens, a second truck pulls up.

08:55:32 22

There's a second box delivered. This contains a variety of

08:55:35 23

blue bricks.

08:55:36 24

Now, if we stop there and think what the child has

08:55:39 25

actually received, have they received a Lego house? The

08:55:43 1 answer is they haven't received a Lego house. They've  
08:55:47 2 received two boxes that contain red bricks, yellow bricks,  
08:55:51 3 blue bricks, green bricks.

08:55:53 4 Now, what can a child do with these -- with these  
08:55:56 5 bricks? Well, the child can take those bricks. They can  
08:55:59 6 put them together, and they can assemble a Lego house.

08:56:03 7 So, once again, has the child received a Lego  
08:56:10 8 house? Has the child -- do the Apple products receive a  
08:56:17 9 processing parameter? No, they don't. The Apple products  
08:56:18 10 actually construct, they compute a processing parameter  
08:56:21 11 themselves in the same way that the child would build the  
08:56:24 12 house themselves.

08:56:24 13 Q. Now, could the child use these same Legos for other  
08:56:28 14 things?

08:56:29 15 A. Yes, they can. And this is the real benefit of doing  
08:56:32 16 it the way that Apple does it.

08:56:33 17 If I can take the next slide, please?

08:56:36 18 The child could take those pieces of bricks, and  
08:56:39 19 if they're so inclined, they could put them together. They  
08:56:42 20 could build themselves a tree using the same pieces of  
08:56:46 21 information.

08:56:46 22 The child can also take these bricks apart and  
08:56:49 23 they can use them for something else. They can build a  
08:56:53 24 horse, for example. So this is really the flexibility of  
08:56:56 25 the approach that Apple has taken.

08:56:57 1 Q. So how does that compare --

08:56:59 2 MR. MUELLER: Your Honor, can I approach the  
08:57:01 3 easel?

08:57:01 4 THE COURT: You may.

08:57:02 5 Q. (By Mr. Mueller) With respect to the information  
08:57:04 6 received by the iPhone, what is Apple able to do with that  
08:57:07 7 information itself other than the processing parameter?

08:57:08 8 A. Well -- well, the benefit is because the Apple products  
08:57:13 9 receive these multiple pieces of information, it can reuse  
08:57:17 10 them for other things. They can be repurposed or used for  
08:57:20 11 other things, as well. They're not just dedicated to a  
08:57:26 12 processing parameter.

08:57:26 13 Q. Now, sir, you took us through this five-step process,  
08:57:31 14 right?

08:57:31 15 A. Yes.

08:57:32 16 Q. In Steps 1, 2, 3, and 4, was there a processing  
08:57:35 17 parameter?

08:57:35 18 A. No, there wasn't.

08:57:37 19 Q. Not until the end?

08:57:40 20 A. Correct.

08:57:40 21 Q. What does the patent require with respect to a  
08:57:42 22 processing parameter?

08:57:43 23 A. As I showed you on that earlier claim, the patent  
08:57:47 24 requires that you receive a processing parameter, and the  
08:57:50 25 Apple products simply don't.

08:57:51 1 Q. Is the Apple approach more or less efficient?

08:57:55 2 A. Well, I -- I think it's a lot more efficient because,  
08:57:58 3 as I think you can see through that analogy, by having  
08:58:02 4 multiple pieces of information, you can reuse them for  
08:58:05 5 other purposes. And that's -- that's what Apple does.

08:58:08 6 Q. And it -- is it more or less flexible, the Apple  
08:58:12 7 approach, as compared to the patent?

08:58:14 8 A. Well, it's far more flexible, too, because everything  
08:58:18 9 can be reused, and you use less bandwidth to download those  
08:58:23 10 initial pieces of information.

08:58:24 11 MR. MUELLER: So if we go back to Claim 6 one more  
08:58:27 12 time.

08:58:28 13 Q. (By Mr. Mueller) Sir, do the Apple products and the  
08:58:37 14 Qualcomm chips within them meet this requirement of  
08:58:41 15 receiving a processing parameter for transmission of data  
08:58:43 16 on two antenna ports, the processing parameter including at  
08:58:47 17 least one of a time delay, a phase rotation, and a gain  
08:58:52 18 determined based on a received uplink signal? Do they meet  
08:58:56 19 that requirement?

08:58:56 20 A. They don't because they don't receive the processing  
08:59:02 21 parameter. They compute it themselves.

08:59:03 22 Q. Now, sir, were you here when Dr. Mahon testified that  
08:59:07 23 Apple's products infringe under something called the  
08:59:12 24 Doctrine of Equivalents?

08:59:13 25 A. Yes, I was.

08:59:13 1 Q. And what do you understand to be the gist of his  
08:59:16 2 opinion on the Doctrine of Equivalents?

08:59:18 3 A. So Dr. Mahon's opinion was that the Apple's -- the  
08:59:25 4 Apple products receive what's called a codebook index and  
08:59:29 5 that that is the equivalent to receiving a processing  
08:59:32 6 parameter.

08:59:32 7 Q. Do you agree?

08:59:33 8 A. I don't.

08:59:33 9 Q. Why not?

08:59:34 10 A. Well, as -- as I understand it, the -- the way to  
08:59:38 11 test -- the legal way to test what's called a Doctrine of  
08:59:41 12 Equivalents is to look at this process, which is called a  
08:59:44 13 function-way-result. Does the equivalent perform  
08:59:49 14 substantially the same function in substantially the same  
08:59:52 15 way to receive substantially the same result? I don't  
08:59:57 16 believe Dr. Mahon's example does that.

08:59:58 17 Q. Why is the function of the Apple products different  
09:00:01 18 from what's claimed in Claim 6?

09:00:03 19 A. Well, Dr. Mahon claims that the Apple products receive  
09:00:08 20 a codebook index, and that's -- that's a completely  
09:00:12 21 different function. The function in the patent is  
09:00:14 22 receiving a processing parameter. A codebook index is  
09:00:18 23 what's generated in the fourth step of that model. So it's  
09:00:21 24 a different function.

09:00:22 25 Q. And why is the way that the Apple products work

09:00:26 1 different from what's claimed in Claim 6?

09:00:28 2 A. Well, way is -- is completely different. The way in  
09:00:35 3 which the patents require is -- is to receive bits of  
09:00:38 4 information that are a processing parameter.

09:00:41 5 The Apple products do pretty much completely the  
09:00:45 6 opposite. They compute that processing parameter  
09:00:47 7 themselves.

09:00:47 8 Q. Sir, what is your conclusion as to whether there is any  
09:00:50 9 infringement under the Doctrine of Equivalents?

09:00:53 10 A. So -- so my opinion there is there's -- there's not  
09:00:57 11 infringement under the Doctrine of Equivalents.

09:00:58 12 Q. Have the Intel or Qualcomm chips ever, to your  
09:01:03 13 knowledge, used the approach of Claim 6 of the '774 patent?

09:01:07 14 A. No, they haven't.

09:01:09 15 Q. Sir, I'd like to shift, if we could, to invalidity. Is  
09:01:14 16 that okay?

09:01:15 17 A. Certainly.

09:01:15 18 Q. I'd like you to, for purposes of my next few questions,  
09:01:19 19 have in mind Dr. Mahon's infringement theory. Is that  
09:01:23 20 okay?

09:01:23 21 A. Yes.

09:01:24 22 Q. So we'll be applying his treatment of the Claim 6 for  
09:01:30 23 purposes of invalidity.

09:01:31 24 A. Yes.

09:01:31 25 Q. And what I'd like you to help -- help all of us with is

09:01:37 1 whether Dr. Mahon's infringement theory would cover old  
09:01:40 2 ideas that predate the patent, okay?

09:01:42 3 A. Yes.

09:01:43 4 Q. All right.

09:01:44 5 MR. MUELLER: Let's go to DDX -- DTX-50 -- 457.

09:01:52 6 Q. (By Mr. Mueller) Dr. Wells, do you know what this is?

09:01:58 7 A. Yes. This is a -- a patent which we call Murakami.

09:02:06 8 Q. And that's based on the inventor's name; is that right,  
09:02:08 9 sir?

09:02:08 10 A. Yes, that's right. The inventor's name being  
09:02:12 11 highlighted here is Murakami.

09:02:15 12 Q. What was the date of publication of Murakami?

09:02:18 13 A. So this was published in January, 2005, which was  
09:02:22 14 several months before the '774 patent was filed.

09:02:24 15 Q. So it's before the '774 patent?

09:02:27 16 A. Correct.

09:02:32 17 Q. Any dispute that this came first?

09:02:35 18 A. No, I don't believe there is.

09:02:36 19 Q. Did the Patent Office have Murakami during the  
09:02:38 20 application process that led to the '774 patent?

09:02:40 21 A. No, they didn't.

09:02:41 22 Q. And what is the relevance of Murakami to this case?

09:02:47 23 A. So it's my opinion that under the infringement theory  
09:02:50 24 that Dr. Mahon has put forward, that this patent here  
09:02:54 25 renders the -- the patent obvious, renders the '774 claim

09:03:00 1 obvious.

09:03:00 2 MR. MUELLER: So if we could pull up Page 583216.

09:03:07 3 That's the Bates number. The internal page is 11, of

09:03:13 4 Murakami. And Zoom in on the second to last paragraph on

09:03:23 5 that page. It's Page 11. Here we go.

09:03:30 6 Q. (By Mr. Mueller) And we also have Figures 3A and 3B

09:03:33 7 here.

09:03:34 8 So, Dr. Wells, could you tell us what we see here?

09:03:36 9 A. Yes, certainly. I'm going to animate this a little

09:03:39 10 bit.

09:03:40 11 This shows in Murakami how this transmission from

09:03:44 12 two antennas -- there's a transmission from one antenna and

09:03:47 13 a second antenna using a first method, and there's

09:03:52 14 transmission from a first antenna and a second antenna

09:03:54 15 using a second method.

09:03:58 16 Now, what Murakami shows, it shows that in each of

09:04:01 17 those transmissions, there's various pieces of information.

09:04:05 18 There's what's called -- there's a -- a -- a first pilot,

09:04:10 19 there's a second pilot, there's a third pilot, there's a

09:04:14 20 fourth pilot, and I know they're pilots because it tells us

09:04:19 21 so underneath.

09:04:20 22 It also sends an indication of what transmission

09:04:24 23 method is being used. Are we using transmission method X

09:04:30 24 or transmission method Y? That's shown here.

09:04:33 25 And then also, importantly, this shows the



09:04:35 1 transmission of various symbols, various pieces of data.  
09:04:39 2 There's a Symbol A, a Symbol B, repeated here, Symbol C,  
09:04:44 3 Symbol D.

09:04:44 4 But some of these symbols have this star or a  
09:04:48 5 negative star after them. That shows what's called a  
09:04:51 6 complex conjugate, which is representation --  
09:04:55 7 representative of a phase change.

09:04:57 8 And this tells us that the transmission -- the  
09:05:05 9 transmission method is transmitted to -- to the  
09:05:11 10 communications terminal. So this essentially teaches a lot  
09:05:14 11 of what's in the patent itself.

09:05:16 12 Q. And under Dr. Mahon's infringement theory, what is the  
09:05:19 13 implication of what you've just shown us?

09:05:22 14 A. So the implication here is that at least the first two  
09:05:26 15 limitations of the claim are covered by this. There's also  
09:05:29 16 additional information in here about how these are  
09:05:32 17 received, how they're demodulated, how the transmission  
09:05:35 18 method and the various pilots are used for the  
09:05:38 19 demodulation, as well. So overall, this renders  
09:05:42 20 everything, using Dr. Mahon's theory, as obvious.

09:05:44 21 MR. MUELLER: Your Honor, may I put a placard up,  
09:05:48 22 a demonstrative?

09:05:49 23 THE COURT: You may.

09:05:56 24 Q. (By Mr. Mueller) And, Dr. Wells, can you see this  
09:05:59 25 here?

09:05:59 1 A. Yes, I can.

09:06:00 2 Q. So I've broken down the claim into three boxes here,  
09:06:05 3 requirement A, B, and C. Do you see that, sir?

09:06:08 4 A. Yes, I do.

09:06:09 5 Q. And I'd like you to explain to the jury, in light of  
09:06:12 6 the Murakami reference that we've been talking about,  
09:06:14 7 whether these requirements were either taught or rendered  
09:06:20 8 obvious by Murakami under Dr. Mahon's infringement theory.  
09:06:24 9 Do you have that in mind?

09:06:25 10 A. Yes, I do.

09:06:26 11 Q. So could you please tell us what your analysis is?

09:06:28 12 MR. SHEASBY: Your Honor, I object. There's no  
09:06:29 13 single -- single reference in Murakami obviousness analysis  
09:06:35 14 submitted in the report. It is always done with other  
09:06:38 15 references.

09:06:38 16 THE COURT: Response?

09:06:39 17 MR. MUELLER: Sure. He's -- I think Dr. Wells is  
09:06:41 18 going to explain exactly that as he walks through the  
09:06:44 19 limitations, and we can pull up whatever else we need to as  
09:06:47 20 we get through it.

09:06:48 21 THE COURT: All right. If there's a need to  
09:06:50 22 object again, Mr. Sheasby --

09:06:52 23 MR. SHEASBY: Thank you, Your Honor.

09:06:52 24 THE COURT: -- please reurge.

09:06:55 25 Q. (By Mr. Mueller) Dr. Wells, could you explain?

09:06:56 1 A. Yes, I -- I -- I tried to explain that all just now.

09:07:00 2 So it's my opinion that all of these three limitations are

09:07:04 3 covered by that explanation that I just gave.

09:07:07 4 Q. Now, you've also looked at some other prior art in this

09:07:11 5 case. Do I have that right, sir?

09:07:12 6 A. Yes, I have.

09:07:13 7 Q. And you've also looked at something called the Hottinen

09:07:20 8 reference. Do I have that right?

09:07:21 9 A. That is correct.

09:07:22 10 MR. MUELLER: Let's pull up the Hottinen

09:07:30 11 reference, if we could.

09:07:32 12 Q. (By Mr. Mueller) And this is DTX-458. Do you see

09:07:37 13 that, sir?

09:07:37 14 A. Yes, I do.

09:07:38 15 Q. And is this another patent that was published before

09:07:41 16 the '774 patent?

09:07:42 17 A. Yes, it was.

09:07:43 18 Q. And what does this teach?

09:07:49 19 A. So this teaches the base station sending a gain

09:07:54 20 parameter down to the mobile device.

09:07:55 21 Q. Now, sir, in light of Murakami, Hottinen, were the

09:08:02 22 limitations of the Claim 6 rendered obvious under

09:08:08 23 Dr. Mahon's infringement theory?

09:08:09 24 A. Yes, they were.

09:08:10 25 Q. May I check these boxes?

09:08:11 1 A. Yes, you may.

09:08:12 2 Q. Let's turn to the second patent that you analyzed in  
09:08:15 3 this case, the '833. Do you have that, sir?

09:08:24 4 A. Yes.

09:08:26 5 Q. And this is PPX-1571 in your binder, and this is the  
09:08:31 6 cover page. Do I have that right, sir?

09:08:33 7 A. Yes, you do. This is the '833 patent.

09:08:34 8 Q. At a high level, what is the '833 patent about?

09:08:38 9 A. This is about how you assemble various pieces of  
09:08:42 10 information in a mobile device so that you can send them up  
09:08:48 11 to a base station.

09:08:49 12 Q. Now, for this patent as well, the plaintiffs are  
09:08:55 13 accusing a portion of the LTE standard as the basis for  
09:08:58 14 infringement?

09:08:58 15 A. That is correct.

09:08:58 16 Q. Have you looked at the history of that section of the  
09:09:01 17 standard?

09:09:01 18 A. Yes, I have.

09:09:07 19 MR. MUELLER: Let's pull up DDX-6.53.

09:09:11 20 Q. (By Mr. Mueller) And this shows DTX-431 and DTX-432.

09:09:17 21 What do we see here, sir?

09:09:19 22 A. So these were two alternatives that were proposed to  
09:09:26 23 the 3GPP organization prior to the '833 patent being put  
09:09:29 24 together -- or being filed.

09:09:32 25 Q. So let's focus on the '833 patent itself.

09:09:39 1 MR. MUELLER: And let's go to DDX-6.51.

09:09:43 2 Q. (By Mr. Mueller) As background, sir, could you tell  
09:09:45 3 us, how does a mobile device send uplink signals?

09:09:50 4 A. So, a mobile device has various uplink signals.  
09:09:55 5 There's what we call data, there's what we call control,  
09:09:57 6 and there's what we call ACK/NACK. And this patent is  
09:10:00 7 about how it assembles them in the instances where they  
09:10:04 8 occur together so that you can send it to a base station.

09:10:09 9 MR. MUELLER: Your Honor, may I approach the  
09:10:11 10 easel?

09:10:12 11 THE COURT: You may.

09:10:13 12 Q. (By Mr. Mueller) Sir, just to make sure we have that  
09:10:18 13 straight, can you list those three types of information one  
09:10:21 14 more time, and I'll write them down?

09:10:23 15 A. Yes. So the first one is data.

09:10:30 16 Q. Second one?

09:10:30 17 A. Second one is control.

09:10:31 18 Q. And third?

09:10:35 19 A. And the third one is what we call ACK/NACK.

09:10:37 20 Q. Now, what does ACK/NACK mean?

09:10:42 21 A. Well, in the -- in the instance when the base station  
09:10:50 22 actually sends information to a handset, the handset has to  
09:10:54 23 respond with an acknowledgement. It's basically a yes or  
09:11:00 24 no; yes, I received the information, or, no, I haven't  
09:11:03 25 received that information. We call that an ACK/NACK, an

09:11:08 1 acknowledgement or a non-acknowledgement.

09:11:11 2 Q. Now, sir, according to the '833 patent, how do these  
09:11:14 3 three types of information need to be formatted, according  
09:11:16 4 to that patent?

09:11:17 5 A. So, according to the '833 patent, there's a very  
09:11:20 6 specific three-step process that is gone through. You have  
09:11:26 7 to perform Step 1, you have to perform Step 2, you have to  
09:11:31 8 perform Step 3, in that order.

09:11:33 9 But the -- the thing I'd like to focus on is this  
09:11:37 10 second step, which is about mapping the data and control to  
09:11:41 11 a 2D matrix.

09:11:43 12 MR. MUELLER: So let's go to DDX-6.52.

09:11:47 13 Q. (By Mr. Mueller) And this is Claim 8 of the '833  
09:11:49 14 patent, right?

09:11:49 15 A. That's correct.

09:11:49 16 Q. What does Claim 8 require with respect to row-by-row  
09:11:55 17 mapping?

09:11:56 18 A. So, there's a section I'm going to talk about, which is  
09:11:58 19 in here -- whoops -- which talks about how the signals are  
09:12:08 20 mapped row-by-row-by-row, into a 2-dimensional resource  
09:12:16 21 matrix.

09:12:17 22 MR. MUELLER: Your Honor, may Dr. Wells leave his  
09:12:20 23 seat to approach the demonstrative with a face shield on?

09:12:24 24 THE COURT: As long as we do it like we did it  
09:12:27 25 yesterday.

09:12:27 1 MR. MUELLER: Thank you, Your Honor.

09:12:53 2 THE WITNESS: May I, Your Honor?

09:12:55 3 THE COURT: Pull that forward just a little bit,  
09:12:56 4 please, sir. Thank you.

09:13:14 5 Yes, you may approach the demonstrative.

09:13:24 6 And, Mr. Sheasby, you may certainly position  
09:13:27 7 yourself where you can see.

09:13:28 8 MR. SHEASBY: Thank you, Your Honor.

09:13:29 9 THE COURT: All right. Mr. Mueller, continue.

09:13:32 10 MR. MUELLER: Thank you, Your Honor.

09:13:33 11 Q. (By Mr. Mueller) Dr. Wells, if you could help us  
09:13:36 12 understand what this requirement means.

09:13:38 13 A. Yes, I can. So the -- the -- the very last part of  
09:13:41 14 that claim --

09:13:41 15 MR. SHEASBY: Your Honor, I object. This is just  
09:13:43 16 a narrative.

09:13:45 17 THE COURT: Overruled.

09:13:47 18 A. The very last part of that claim requires mapping to a  
09:13:51 19 2-dimensional matrix. So what I've done here, I've drawn a  
09:13:59 20 2-dimensional matrix. This matrix has a number of columns,  
09:14:06 21 one, two, three, four, and a number of rows, one, two,  
09:14:11 22 three, four.

09:14:14 23 Q. (By Mr. Mueller) And, sir, let's take this  
09:14:16 24 piece-by-piece. Can you please explain to the ladies and  
09:14:20 25 gentlemen of the jury -- I'm going to quote from the claim

09:14:21 1 language here -- how the, quote, multiplex signals are  
09:14:25 2 mapped from the first column of the first row to the last  
09:14:29 3 column of the first row?

09:14:31 4 A. Yes. So the -- the first column, first row, is here.  
09:14:37 5 And then it's mapped to -- it's the last column of the  
09:14:41 6 first row, which is here. So it means that information is  
09:14:46 7 mapped in this order, one, two, three, four.

09:14:51 8 Q. And if we continue with the claim language, can you  
09:14:53 9 please explain how, quote, the first column of the second  
09:14:56 10 row to the last column of the second row, how that works?

09:15:01 11 A. Sir, the first column of the second row is here. So  
09:15:05 12 after four, we place the five in here, and we proceed to  
09:15:08 13 here, six, seven, eight.

09:15:11 14 Q. And it says, quote, and so on, until all the multiplex  
09:15:18 15 signals are mapped to the 2-dimensional resource matrix,  
09:15:22 16 end quote?

09:15:22 17 A. So that would mean that this continues by going 9, 10,  
09:15:28 18 11, 12, 13, 14, 15, 16.

09:15:36 19 Q. And that's the claim of the '833 patent?

09:15:37 20 A. Correct, that's the claim of the '8 -- of the patent.

09:15:42 21 Q. How do the Apple products and the Intel and Qualcomm  
09:15:47 22 chips within them actually work?

09:15:49 23 A. So, with this here, the mapping has all been  
09:15:58 24 row-by-row-by-row-by-row. The Apple and Intel products  
09:16:06 25 don't work like that. They map in a different order. They



09:16:09 1 map column-by-column.

09:16:10 2 Q. And could you illustrate on the right-hand side how  
09:16:12 3 column-by-column mapping works?

09:16:14 4 A. Yes, I can. So the way the Apple -- the Intel products  
09:16:20 5 work is, instead of generating a 2-dimensional matrix,  
09:16:23 6 there is no concept of that in the code. Instead, there's  
09:16:26 7 just a column, and data is placed into that column in this  
09:16:32 8 order here, one, two, three, four. And then once that  
09:16:38 9 column has been assembled, it's sent out, it's passed on to  
09:16:43 10 the next step in the processing for transmission.

09:16:45 11 And then, after that, what happens is these have  
09:16:49 12 been replaced with numbers 5, 6, 7, and 8. And then it's  
09:16:55 13 passed on to the rest of the circuit for processing until  
09:16:59 14 all the 16 have been mapped.

09:17:01 15 And so this is -- as you can see, this is a  
09:17:06 16 column-by-column mapping.

09:17:07 17 Q. How does this approach compare to the claimed approach  
09:17:12 18 in terms of the actual performance of the device?

09:17:14 19 A. This is a far more efficient way of doing it, because  
09:17:19 20 you don't have to build up this -- in this case, this  
09:17:24 21 16-element matrix. You just have to deal with the four  
09:17:27 22 things that you're interested in, pass them off, and then  
09:17:31 23 you start again.

09:17:32 24 Takes a lot less memory, and it's also a lot more  
09:17:34 25 efficient because it's faster.

09:17:36 1 Q. Now, how did you develop this understanding? What  
09:17:38 2 materials did you consider in developing this understanding  
09:17:42 3 of the Intel and Qualcomm chips?

09:17:45 4 A. So I looked at what connotation, I looked at the source  
09:17:50 5 code for the Qualcomm and the Intel chips, and for the case  
09:17:54 6 of Intel, I talked with Dr. Josiam.

09:17:56 7 Q. Now, Dr. Josiam testified to the ladies and gentlemen  
09:17:58 8 of the jury yesterday?

09:17:58 9 A. That is correct.

09:17:59 10 Q. And did you hear him testify about the way the products  
09:18:04 11 map to -- map this sort -- sort of information?

09:18:06 12 A. That's right. He -- yes, I did.

09:18:09 13 Q. Was his testimony consistent or inconsistent with your  
09:18:12 14 own views?

09:18:13 15 A. It's consistent with the findings that I have found.  
09:18:18 16 So he agreed with me that this is how the products actually  
09:18:21 17 worked -- or he confirmed my understanding this is how the  
09:18:25 18 products actually work.

09:18:25 19 MR. MUELLER: Your Honor, may Dr. Wells return to  
09:18:28 20 his seat?

09:18:29 21 THE COURT: Yes, he may.

09:18:32 22 MR. MUELLER: And I'll eliminate the -- move it  
09:18:35 23 over.

09:18:47 24 Q. (By Mr. Mueller) Now, if we go back to Claim 8 again,  
09:18:55 25 given what we just went through, Dr. Wells, do the Intel

09:18:58 1 and Qualcomm chips meet the requirements of Claim 8?

09:19:02 2 A. No, they don't, because they don't map row-by-row, as  
09:19:06 3 is required.

09:19:08 4 Q. Now, were you here when Dr. Madisetti testified?

09:19:13 5 A. Yes, I was.

09:19:13 6 Q. And what did you understand to be the thrust of his  
09:19:15 7 opinion on this issue?

09:19:16 8 A. Well, Dr. Madisetti appeared to disagree with me; that  
09:19:23 9 he appeared to claim that somehow row-by-row mapping was  
09:19:28 10 column-by-column mapping.

09:19:30 11 Q. Do you agree with him?

09:19:31 12 A. No, I don't.

09:19:33 13 MR. MUELLER: Let's pull up DDX-6.55.

09:19:37 14 Q. (By Mr. Mueller) And do you have an analogy to help us  
09:19:39 15 with this, sir?

09:19:39 16 A. Yes, I do. This analogy -- a different one this time.  
09:19:43 17 It involves children. Imagine children leaving school at  
09:19:48 18 the end of the day. They're all taking the school bus  
09:19:51 19 home.

09:19:51 20 Now, what I've shown on the left-hand side is the  
09:19:54 21 '833 patent, and here we have a number of school buses all  
09:19:57 22 lined up, ready to take the children home.

09:20:00 23 As -- as the kids stream out of school, they start  
09:20:03 24 filling up these buses. They go to the back seats of the  
09:20:09 25 bus, and they go across the various buses, buses 1, 2, 3,

09:20:14 1 4, and they fill up the back of the buses going forward  
09:20:17 2 until all the buses are full, and then the buses leave.

09:20:20 3 Now, if we look at what happens in the Qualcomm  
09:20:23 4 and Intel code, which I've shown on the right-hand side, a  
09:20:27 5 single bus fills up. The children get on that bus from the  
09:20:31 6 back of the bus, they fill it up until they get to the  
09:20:33 7 front, and then, once that bus is full, the bus leaves. A  
09:20:40 8 second bus pulls up, the kids get into this bus, and they  
09:20:44 9 fill it up, and so on until all the children have been  
09:20:47 10 taken home.

09:20:48 11 Q. Now, sir, what is the functional difference between  
09:20:57 12 these two approaches that we see?

09:20:58 13 A. Well, you can see in this analogy that the way that the  
09:21:02 14 Qualcomm and -- excuse me -- the way the Intel and Qualcomm  
09:21:06 15 engineers have decided to do this is far more efficient.  
09:21:08 16 You don't need a big parking lot to park lots of buses.  
09:21:13 17 You -- the kids in the first buses get home much faster.  
09:21:17 18 It's a much more efficient way of doing -- of taking kids  
09:21:21 19 home from school.

09:21:22 20 MR. MUELLER: Your Honor, may I approach the  
09:21:23 21 easel?

09:21:23 22 THE COURT: You may.

09:21:26 23 Q. (By Mr. Mueller) So, Dr. Wells, so for the '774  
09:21:29 24 patent, the big fight is the processing parameter. Do I  
09:21:32 25 have that right?

09:21:33 1 A. That's correct.

09:21:33 2 Q. So for the '833 -- get a marker that works here -- is

09:21:42 3 it fair to say the big fight is row-by-row versus

09:21:47 4 column-by-column?

09:21:47 5 A. Yes, it is. The patent requires row-by-row mapping,

09:21:53 6 and the Intel and Qualcomm chips map column-by-column.

09:21:56 7 Q. Bottom line, sir, do the Intel and Qualcomm chips and

09:22:03 8 the Apple products that have those chips infringe the '833

09:22:06 9 patent?

09:22:06 10 A. No, they don't.

09:22:07 11 Q. Let's turn to invalidity. And, again, I'm going to ask

09:22:10 12 you, sir, if you could, to have in mind Dr. Madisetti's

09:22:14 13 infringement theory and how that theory would apply to what

09:22:18 14 came before the '833 patent. Do you have that in mind?

09:22:20 15 A. Yes, I do.

09:22:21 16 MR. MUELLER: Let's go to DDX-6.60.

09:22:31 17 Q. (By Mr. Mueller) And what do we see here?

09:22:32 18 A. So I have here four different pieces of prior art.

09:22:36 19 These were all published before the '833 patent.

09:22:38 20 On the left, I've got a Qualcomm document,

09:22:43 21 DTX-416. Next to that, I've got another Qualcomm patent,

09:22:46 22 DTX-593. I then have a third Qualcomm patent, DTX-522.

09:22:51 23 And, finally, I have a Samsung document that was submitted

09:22:55 24 to 3GPP. That's DTX-423.

09:22:58 25 Q. And all of these came before the '833 patent. Do I

09:23:03 1 have that right?

09:23:04 2 A. Yes, that's correct.

09:23:07 3 MR. MUELLER: So if we could go back to Claim 8

09:23:09 4 and just put the language on the screen.

09:23:11 5 Q. (By Mr. Mueller) Sir, have you considered whether,

09:23:18 6 under Dr. Madisetti's infringement theory, each and every

09:23:25 7 one of these claim limitations would have been disclosed by

09:23:28 8 that prior art you just showed us?

09:23:30 9 A. Yes, I have.

09:23:30 10 Q. What's your conclusion?

09:23:31 11 A. So under Dr. Madisetti's opinion where the row-by-row

09:23:35 12 doesn't need to be row-by-row, then the -- those four

09:23:40 13 pieces of prior art would render this -- this -- this claim

09:23:43 14 invalid.

09:23:44 15 Q. Under Dr. Madisetti's infringement theory; do I have

09:23:48 16 that right, sir?

09:23:49 17 A. Correct.

09:23:50 18 Q. If Dr. Madisetti were right -- and I understand you

09:23:57 19 think he is wrong -- what would be the implication for this

09:24:00 20 patent?

09:24:00 21 A. Well, if Dr. Madisetti is correct, this patent would be

09:24:03 22 invalid.

09:24:03 23 Q. Now, are you criticizing the Patent Office in any way

09:24:10 24 in your invalidity analysis for the '833 or '774?

09:24:12 25 A. No, I'm not.

09:24:18 1 Q. Let's go over a few final issues here.

09:24:22 2 MR. MUELLER: Can we go to DDX-6.61?

09:24:24 3 Q. (By Mr. Mueller) Now, we're going to hear from a  
09:24:26 4 Dr. Perryman later today, and you know who he is?

09:24:28 5 A. Yes, I do.

09:24:29 6 Q. And he's going to respond to some of the damages  
09:24:32 7 arguments that the Plaintiffs have made?

09:24:36 8 A. I believe so.

09:24:37 9 Q. What do we see here, sir, on DDX-6.61, which is  
09:24:42 10 referring to DTX-1755, DTX-1894, and DTX-1897?

09:24:52 11 A. So I think they're supporting materials to all of these  
09:24:55 12 licenses that are shown here that are listed with all these  
09:24:58 13 other DTX numbers.

09:25:01 14 Q. And are these licenses technologically similar to  
09:25:04 15 Plaintiffs' patents?

09:25:05 16 A. Yes, yes, they are.

09:25:09 17 MR. MUELLER: Your Honor, may I approach the easel  
09:25:11 18 one last time?

09:25:15 19 THE COURT: You may.

09:25:16 20 MR. MUELLER: Thank you.

09:25:16 21 Q. (By Mr. Mueller) If we take that down and -- just a  
09:25:20 22 few final questions, Dr. Wells.

09:25:22 23 If you could sum up here, for the '774 patent,  
09:25:30 24 what is the big issue in dispute?

09:25:32 25 A. So the big issue is whether the Apple products receive

09:25:37 1 a processing parameter.

09:25:38 2 Q. Do they?

09:25:39 3 A. They don't receive a processing parameter. They do the  
09:25:44 4 opposite; they compute it themselves.

09:25:47 5 Q. Under a proper application of the claims of the '774  
09:25:54 6 patent, is there any infringement?

09:25:55 7 A. No, there isn't.

09:25:57 8 Q. And under the broad theory of Dr. Mahon, what would be  
09:26:03 9 the validity of this patent?

09:26:04 10 A. Well, under Dr. Mahon's application where he stretched  
09:26:08 11 the meanings of the claim, the patent would be invalid.

09:26:11 12 Q. '833, what is the big issue in dispute?

09:26:14 13 A. The big issue is whether there's row-by-row mapping or  
09:26:17 14 not.

09:26:17 15 Q. Is there?

09:26:19 16 A. No, there isn't. There's column-by-column mapping.

09:26:22 17 Q. Is there -- sorry.

09:26:25 18 Is there any infringement of the '833 patent by  
09:26:29 19 the Intel and Qualcomm chips?

09:26:30 20 A. No, there isn't.

09:26:31 21 Q. Under Dr. Madisetti's broad infringement theory, what  
09:26:40 22 would be the validity of his patent?

09:26:42 23 A. Under Dr. Madisetti's theory, the patent would be  
09:26:45 24 invalid.

09:26:45 25 Q. Thank you, sir. I have no further questions.



09:26:50 1 MR. MUELLER: I pass the witness, Your Honor.

09:26:51 2 THE COURT: Cross-examination by the Plaintiff.

09:26:58 3 Please turn that sheet to a clean page, please.

09:27:21 4 MR. SHEASBY: May I approach, Your Honor?

09:27:23 5 THE COURT: You may.

09:27:23 6 MR. SHEASBY: Thank you, Your Honor.

09:28:00 7 May I proceed, Your Honor?

09:28:02 8 THE COURT: You may proceed.

09:28:07 9 MR. SHEASBY: Oh, I forgot one thing.

09:28:09 10 THE COURT: That's all right.

09:28:09 11 MR. SHEASBY: Thank you for your indulgence,

09:28:14 12 Your Honor.

09:28:14 13 THE WITNESS: Thank you.

09:28:15 14 THE COURT: All right. Mr. Sheasby, whenever  
09:28:16 15 you're ready.

09:28:16 16 CROSS-EXAMINATION

09:28:17 17 BY MR. SHEASBY:

09:28:17 18 Q. Good morning, Dr. Wells. It's nice to see you again.

09:28:21 19 A. Good morning.

09:28:21 20 Q. We met before, on the Internet?

09:28:25 21 A. That's correct.

09:28:25 22 Q. Dr. Wells, you've been a paid expert for Apple 10 times  
09:28:31 23 in the last 10 years, correct?

09:28:32 24 A. I -- I don't think it's that many, no.

09:28:37 25 Q. Well, I actually have your CV in front of you, and I've

09:28:41 1 highlighted each example, and so you can count. And count  
09:28:46 2 out loud as you go through them.

09:28:48 3 A. Well, the ones that you've highlighted, one, two,  
09:28:52 4 three, four, five, six, seven, eight, nine.

09:29:05 5 Q. And, in fact, you're actually doing two cases  
09:29:08 6 simultaneously for Apple right now. So that first one  
09:29:12 7 actually constitutes two cases -- two cases, correct, the  
09:29:15 8 second one?

09:29:15 9 A. No, that's not true.

09:29:17 10 Q. So it's not?

09:29:18 11 A. Not as far as I know, no.

09:29:20 12 Q. So you've just counted nine highlighted cases that  
09:29:24 13 involve work that have Apple and you've underlined "Apple"  
09:29:27 14 in them, correct?

09:29:29 15 A. Since I've been consulting over 14 years, yes.

09:29:31 16 Q. And those cases that I highlighted are from the last 10  
09:29:36 17 years, correct?

09:29:36 18 A. The earliest was 2011. So yes, that would be 10 years.

09:29:42 19 Q. Ten years, nine cases for Apple?

09:29:45 20 A. Yes.

09:29:45 21 Q. In the last five years, you've billed over 896,000  
09:29:54 22 dollars to Apple, correct?

09:29:56 23 A. I think that's true.

09:29:57 24 Q. And at your deposition you testified that Apple was  
09:29:59 25 only a small portion of your income, correct?

09:30:01 1 A. No. I didn't quite say that, sir.

09:30:03 2 Q. Well, you said the amount attributable to Apple over  
09:30:07 3 the last 10 years is, quote, not a large amount.

09:30:09 4 A. And you were asking me in terms of percentages, and  
09:30:12 5 that was my answer.

09:30:13 6 MR. SHEASBY: Your Honor, I move to strike as  
09:30:15 7 non-responsive.

09:30:19 8 THE COURT: Overruled.

09:30:20 9 Q. (By Mr. Sheasby) So as a percentage of your income,  
09:30:22 10 the \$896,000 that you received from Apple over the last ten  
09:30:26 11 years is just a small percentage of your income, correct?

09:30:29 12 A. I don't think that's quite what I said, no.

09:30:31 13 Q. Now, sir, you showed a set of license agreements to the  
09:30:38 14 ladies and gentlemen of the jury, correct?

09:30:38 15 A. Yes, I did.

09:30:39 16 Q. You suggested that they were comparable, correct?

09:30:43 17 A. Yes, that's correct.

09:30:44 18 Q. You didn't analyze whether a single patent in those  
09:30:46 19 license agreements were actually essential to the LTE  
09:30:50 20 standard, correct?

09:30:50 21 A. That wasn't my task. So, no, I didn't.

09:30:55 22 Q. You didn't analyze whether a single one of those  
09:30:58 23 patents actually related to mobile phones as opposed to  
09:31:00 24 base stations, correct?

09:31:01 25 A. Again, that wasn't my task. So, no, I didn't.

09:31:05 1 Q. In fact, you've never attended an LGE -- an LTE meeting  
09:31:10 2 at 3GPP, correct?

09:31:11 3 A. Not at 3GPP, no.

09:31:14 4 Q. You've never written any of the standards that are used  
09:31:18 5 in 3GPP, correct?

09:31:19 6 A. Not that are used in -- not the way you phrased it, no.

09:31:24 7 Q. The iPhone 6 practices the LTE standard, correct?

09:31:27 8 A. Well, if you mean does the iPhone work on LTE, yes, it  
09:31:33 9 does.

09:31:34 10 MR. SHEASBY: Your Honor, I move to strike as  
09:31:35 11 non-responsive.

09:31:42 12 THE COURT: He's attempting to be responsive,  
09:31:44 13 Mr. Sheasby. I'll overrule you. If you'd like to reurge  
09:31:47 14 the question because you don't think he understood it or  
09:31:49 15 you want to ask it another way, that's fine.

09:31:50 16 Q. (By Mr. Sheasby) Yes or no? Does the iPhone 6 and  
09:31:54 17 later, practice the LTE standard?

09:31:56 18 A. Well, I don't quite know what you mean by "practice."  
09:32:02 19 If you mean does it use the LTE standard, the answer is  
09:32:06 20 yes.

09:32:06 21 MR. SHEASBY: So I move to strike after "I don't  
09:32:09 22 quite know what you mean," Your Honor.

09:32:10 23 THE COURT: All right. I'll limit the witness's  
09:32:14 24 answer by "I don't quite know what you mean by 'practice,'"  
09:32:19 25 period.

09:32:20 1 Q. (By Mr. Sheasby) You don't know what I mean by

09:32:21 2 "practicing" the LTE standard, fair?

09:32:23 3 A. Yes. If you could be more specific, please.

09:32:26 4 Q. You've been a consultant for the past 13 years, and you

09:32:30 5 haven't written any source code as part of your consulting

09:32:34 6 work, correct?

09:32:35 7 A. Not as part of my consulting work. Correct.

09:32:37 8 Q. The source code in this case is written in C or Verilog

09:32:43 9 languages, correct?

09:32:43 10 A. Amongst others as well.

09:32:43 11 Q. You've never written in C or Verilog, correct?

09:32:44 12 A. No. My time writing source code was a long time ago.

09:32:47 13 MR. SHEASBY: Your Honor, I move to strike as

09:32:49 14 non-responsive, anything after --

09:32:51 15 THE COURT: Overruled.

09:32:52 16 Q. (By Mr. Sheasby) Sir, you --

09:32:53 17 THE COURT: Mr. Sheasby, please slow down.

09:32:57 18 Q. (By Mr. Sheasby) Sir, you admit that you're not a

09:32:59 19 source code guy, correct?

09:33:00 20 A. I'm a wireless engineer. I would agree with that.

09:33:07 21 Q. You're not a source code guy, fair?

09:33:08 22 A. Again, my specialization is wireless communications. I

09:33:12 23 can read source code, but I'm not a source code guy.

09:33:15 24 Q. For the ladies and gentlemen of the jury, you're not a

09:33:17 25 source code guy, correct?

09:33:18 1 A. That's correct.

09:33:19 2 Q. And this case is about source code, correct?

09:33:21 3 A. No. It's about five patents.

09:33:25 4 Q. This case is not about source code? Source code is not  
09:33:29 5 an important part of this case, sir?

09:33:30 6 A. Oh, I would agree with that.

09:33:31 7 Q. You know, what was interesting to me is you talked  
09:33:35 8 about the '833 patent today, and you didn't show a single  
09:33:38 9 line of source code, did you?

09:33:39 10 A. No, I didn't.

09:33:41 11 Q. And it's fair that the jury can take that into account  
09:33:47 12 when they think about your credibility, fair?

09:33:50 13 A. Certainly, yes.

09:33:52 14 MR. SHEASBY: Let's go to PDX-3.80.

09:33:57 15 Q. (By Mr. Sheasby) So this is a slide from Professor  
09:34:15 16 Mahon's testimony, correct?

09:34:16 17 A. I believe so, yes.

09:34:17 18 Q. You were there for his testimony, correct?

09:34:19 19 A. I was.

09:34:19 20 Q. This codebook information is present in the code on the  
09:34:23 21 mobile phone, fair?

09:34:24 22 A. I'm sorry, what are you pointing at? Oh, this table?  
09:34:32 23 Yes, this is the fifth step in that five-step process I  
09:34:36 24 talked about.

09:34:36 25 Q. This table is in the mobile phone, correct?

09:34:38 1 A. Well, a representation of it, yes.

09:34:40 2 Q. And you don't dispute that that represents gain,  
09:34:43 3 correct?

09:34:43 4 A. That is correct.

09:34:44 5 Q. And you don't dispute that that represents phase  
09:34:48 6 rotation, correct?

09:34:48 7 A. That is correct.

09:34:50 8 MR. SHEASBY: Let's go to PDX-3.81.

09:34:56 9 Q. (By Mr. Sheasby) This table is the table that's at the  
09:35:00 10 base station representing the code that's sent down to the  
09:35:05 11 mobile phone, fair?

09:35:06 12 A. I -- I don't know. I haven't seen that evidence.

09:35:08 13 Q. You don't know what is Table 5.3.3.1.5-4?

09:35:15 14 A. Yes, I do know what the table is.

09:35:17 15 Q. What is the table?

09:35:18 16 A. So the table -- this is the fourth step in that  
09:35:22 17 five-step process that I talked about.

09:35:23 18 Q. And this is the bits that are sent down to the mobile  
09:35:26 19 phone; is that correct?

09:35:26 20 A. No.

09:35:27 21 Q. These are the codewords that are sent down to the  
09:35:32 22 mobile phone; is that correct?

09:35:33 23 A. My understanding is, is that they are part of the DCI  
09:35:38 24 format 2 message.

09:35:39 25 Q. That's sent down to the mobile phone?

09:35:42 1 A. Yes.

09:35:42 2 Q. And in that message that's sent down to the mobile  
09:35:46 3 phone, you'll see that in this table there's a reference to  
09:35:48 4 one-half, correct?

09:35:49 5 A. In this table, which is derived using those other three  
09:35:56 6 steps, yes.

09:35:56 7 MR. SHEASBY: Your Honor --

09:35:59 8 Q. (By Mr. Sheasby) There's a reference to one-half that  
09:36:01 9 is a gain, correct?

09:36:02 10 A. Correct.

09:36:02 11 Q. And you don't dispute that's a gain, correct?

09:36:04 12 A. I don't dispute that.

09:36:05 13 Q. And there's also a reference to a j, correct?

09:36:08 14 A. Yes.

09:36:09 15 Q. You don't dispute that j is phase rotation, correct?

09:36:13 16 A. Correct, I don't dispute that.

09:36:14 17 Q. And the claims recite gain and phase rotation, correct?

09:36:17 18 A. They do.

09:36:22 19 MR. SHEASBY: Let's go to the '833 patent, and  
09:36:25 20 pull up PX-2.128. I'm sorry, P -- PDX-2.128. 128,  
09:36:57 21 Mr. Huynh. PDX-2.128.

09:37:05 22 Q. (By Mr. Sheasby) Okay. I'm showing this document on  
09:37:07 23 the left, which is from Qualcomm, correct?

09:37:09 24 A. It appears to be, yes.

09:37:12 25 Q. It literally says Qualcomm, correct?



09:37:17 1 A. It says Qualcomm University.

09:37:20 2 Q. And this document was produced in Apple's records,  
09:37:23 3 correct?

09:37:23 4 A. I don't know. It has a Plaintiffs' number on it. I'm  
09:37:28 5 not sure.

09:37:28 6 Q. So you don't know if this was found in Apple's records,  
09:37:32 7 sir?

09:37:32 8 A. Yes, I don't know the answer to that.

09:37:34 9 Q. You didn't investigate in preparation for your  
09:37:38 10 deposition, correct?

09:37:38 11 A. I did use it because I believed Dr. Madisetti referred  
09:37:41 12 to it.

09:37:41 13 Q. But you didn't know -- you don't know whose records it  
09:37:45 14 was in, correct?

09:37:47 15 A. That's correct.

09:37:47 16 MR. MUELLER: I'm sorry to interrupt.

09:37:49 17 This is a Qualcomm document, so if Mr. Sheasby is  
09:37:51 18 going to get into this, he's going to have to seal the  
09:37:54 19 courtroom for Qualcomm information.

09:37:55 20 MR. SHEASBY: Seal the courtroom.

09:37:57 21 THE COURT: All right. At the request of counsel,  
09:37:59 22 I will order the courtroom sealed. Those of you present  
09:38:02 23 not subject to the protective order should excuse  
09:38:06 24 yourselves until the courtroom is reopened and unsealed.

09:38:09 25 (Courtroom sealed.)

09:38:09 1 (This portion of the transcript is sealed  
09:38:09 2 and filed under separate cover as  
09:38:24 3 Sealed Portion No. 14.)  
09:38:24 4 (Courtroom unsealed.)  
09:45:34 5 THE COURT: Dr. Wells, you may step down, sir.  
09:45:37 6 THE WITNESS: Thank you.  
09:45:38 7 MR. SHEASBY: Your Honor, may we clear binders?  
09:45:40 8 THE COURT: Please.  
09:45:56 9 MR. MUELLER: Oh, yes. Your Honor, may Dr. Wells  
09:45:58 10 be released?  
09:45:59 11 THE COURT: Any objection from Plaintiff?  
09:46:00 12 MR. SHEASBY: No objection, Your Honor.  
09:46:01 13 THE COURT: The witness is excused.  
09:46:20 14 Defendant, who is your next witness?  
09:46:23 15 MR. MUELLER: Your Honor, we call Vivek  
09:46:28 16 Ramaprasad, and Mr. Summersgill will conduct the  
09:46:32 17 examination.  
09:46:32 18 THE COURT: What is your expected direct,  
09:46:36 19 Mr. Summersgill, lengthwise?  
09:46:37 20 MR. SUMMERSGILL: About 15 minutes, Your Honor.  
09:46:39 21 THE COURT: Let's proceed.  
09:46:42 22 If the witness will come forward and be sworn,  
09:46:47 23 please.  
09:46:47 24 (Witness sworn.)  
09:47:02 25 THE COURT: Please come around, sir, have a seat

09:47:04 1 at the witness stand.

09:47:09 2 All right. Mr. Summersgill, you may proceed with  
09:47:11 3 your direct examination.

09:47:12 4 MR. SUMMERSGILL: Thank you, Your Honor.

09:47:12 5 VIVEK RAMAPRASAD, DEFENDANT'S WITNESS, SWORN

09:47:12 6 DIRECT EXAMINATION

09:47:13 7 BY MR. SUMMERSGILL:

09:47:13 8 Q. Good morning. Would you please introduce yourself to  
09:47:16 9 the jury and tell them your name and where you live?

09:47:19 10 A. Good morning. I'm Vivek Ramaprasad. I live in  
09:47:23 11 Southern California, San Diego.

09:47:24 12 Q. And would you please tell the jury about your  
09:47:27 13 educational background?

09:47:27 14 A. Yeah. I grew up in India. I got my undergraduate in  
09:47:33 15 electrical engineering in India, and then I came to do my  
09:47:36 16 Master's here in University of Missouri, and then I got my  
09:47:39 17 MBA from University of Michigan.

09:47:41 18 Q. And where do you work, Mr. Ramaprasad?

09:47:44 19 A. I work for Apple.

09:47:44 20 Q. And how long have you worked for Apple?

09:47:46 21 A. It's been about a year now.

09:47:49 22 Q. And what did you do before you joined Apple?

09:47:51 23 A. Before Apple, I worked for Intel.

09:47:57 24 Q. And what was Intel's business when you worked there?

09:48:00 25 A. We specialized in making computer chips.

09:48:03 1 Q. And what specifically did you work on at Intel?

09:48:06 2 A. So in the chip-making industry, I was involved in  
09:48:10 3 making these baseband modem chips for mobile phones.

09:48:15 4 Q. And what part of the baseband chip did you focus on at  
09:48:18 5 Intel?

09:48:18 6 A. On the baseband chip, my primary focus was on something  
09:48:23 7 called the PDCCH processing.

09:48:25 8 Q. And how long did you work on -- in the baseband chip  
09:48:30 9 unit at Intel?

09:48:30 10 A. Yeah, that's a long time. I worked for 21 years.  
09:48:34 11 That's close to half my life.

09:48:37 12 Q. Mr. Ramaprasad, why did you leave Intel to come to  
09:48:40 13 Apple?

09:48:40 14 A. As an electrical engineer, it's always been my passion  
09:48:45 15 to build chips, and late last year my division was moved  
09:48:53 16 over to Apple, so -- and I continued to pursue my passion.

09:48:56 17 Q. And what are you working on at Apple now?

09:48:58 18 A. At Apple I'm continuing to pursue my passion of  
09:49:04 19 building great chips.

09:49:05 20 Q. Now, Mr. Ramaprasad, how long, over the course of your  
09:49:09 21 career, have you been working on designing and developing  
09:49:13 22 baseband chips?

09:49:13 23 A. It's 21 years.

09:49:15 24 Q. And have you received any patents for the work that  
09:49:17 25 you've done?

09:49:18 1 A. Yes, I do have four patents.

09:49:20 2 Q. Now, Mr. Ramaprasad, what is the technology that you  
09:49:25 3 worked on that you understand is at issue in this case?

09:49:27 4 A. So in this case, it's particularly PDCCH, which belongs  
09:49:32 5 to LTE.

09:49:33 6 Q. And what does "PDCCH" mean?

09:49:35 7 A. It's a short form for Physical Downlink Control  
09:49:43 8 Channel.

09:49:43 9 Q. And what is the PDCCH channel?

09:49:45 10 A. So, I mean, we can imagine a channel as -- we know the  
09:49:50 11 cell phone tower, and we have our mobile phones, right? So  
09:49:53 12 this is like a wireless channel where the control  
09:49:57 13 information is exchanged between the cell phone tower and  
09:50:00 14 the mobile phone.

09:50:01 15 Q. And what is the control information that you just  
09:50:03 16 referred to?

09:50:04 17 A. So it's the information which is important for the  
09:50:09 18 mobile phone which tells how much a user can talk, how much  
09:50:14 19 of Internet it can download, and things like that.

09:50:15 20 Q. And at a high level, how does this PDCCH process work?

09:50:20 21 A. So in very simple terms, the mobile phone needs to look  
09:50:26 22 into this wireless channel, and it needs to find this  
09:50:30 23 control information. To find the control information, they  
09:50:33 24 need to start searching. To start searching, they need to  
09:50:38 25 find a start position.

09:50:39 1 Q. And where in the Apple devices does this PDCCH

09:50:44 2 processing occur?

09:50:45 3 A. So this happens in the tiny mobile chip inside the

09:50:51 4 source code inside the baseband chip.

09:50:53 5 Q. And how can you figure out how that processing in the

09:50:56 6 baseband chip works?

09:50:57 7 A. So we write instructions which go into these baseband

09:51:04 8 chip, and we -- it's usually in the form of source code.

09:51:08 9 Q. And who wrote the source code for the PDCCH processing

09:51:12 10 in the Intel baseband chips?

09:51:14 11 A. I wrote the source code.

09:51:15 12 Q. Now, Mr. Ramaprasad, what did you first begin working

09:51:19 13 on PDCH -- PDCCH processing technology in the Intel chips?

09:51:26 14 A. It was back in August of 2012.

09:51:28 15 Q. And at a high level, what was Intel's goal with respect

09:51:32 16 to the design of the PDCCH processing?

09:51:35 17 A. So there are two goals. One is we had to make things

09:51:40 18 work with the LTE standard. Then the most important goal

09:51:44 19 is to make it work on the tiniest of chips.

09:51:46 20 Q. And what did you and the other engineers working on

09:51:49 21 this technology do to develop it?

09:51:51 22 A. So when we started -- I think it was like a blank

09:51:57 23 slate. So we had this tiny chip, and to make this tiny

09:52:00 24 chip, what do we need to do is to go build -- look at these

09:52:05 25 complex of problems, break it down into simplest of

09:52:11 1 solution.

09:52:11 2 Q. And how long did it take to design the PDCCH processing  
09:52:15 3 technology?

09:52:15 4 A. It's a very long affair. It's multiple years.

09:52:18 5 Q. And can you explain the challenges you faced over those  
09:52:21 6 years?

09:52:21 7 A. It was extremely challenging. I mean, to start from a  
09:52:26 8 blank slate and squeeze everything in these tiniest of  
09:52:33 9 chips, it was long nights and weekends and a lot of  
09:52:36 10 thinking, especially when you step back, look at a complex  
09:52:39 11 problem, find the simplest of solutions. That's the  
09:52:43 12 hardest part.

09:52:44 13 Q. And what was the result of all that hard work?

09:52:46 14 A. I can't qualify in words, but what I can say is when I  
09:52:51 15 see people walk -- walk around using their phones, talking  
09:52:56 16 to their loved ones, it's a really heartening feeling.

09:53:01 17 Q. Now does your own work involve the LTE standard?

09:53:03 18 A. Yes.

09:53:03 19 Q. How has your work involved the LTE standard?

09:53:07 20 A. So I worked on the LTE standard by writing these  
09:53:11 21 instructions which go into many instructions which go into  
09:53:14 22 making this chip work on the LTE standard.

09:53:17 23 MR. SUMMERSGILL: And if we could pull up DTX-8.3,  
09:53:30 24 please.

09:53:30 25 Q. (By Mr. Summersgill) And turning to Page 64, please,

09:53:34 1 Mr. Ramaprasad, could you tell us what this is?

09:53:45 2 A. Yes. So this is the LTE standard or the specification,  
09:53:48 3 and this particular paragraph or the section tells us what  
09:53:52 4 needs to be done to find the start position.

09:53:54 5 Q. And so this portion of the standard relates to PDCCH  
09:53:59 6 processing?

09:54:01 7 A. It's one part of the PDCCH processing.

09:54:04 8 Q. And did you help to design the Intel chips in order to  
09:54:07 9 operate with this portion of the standard?

09:54:09 10 A. Yes, I did.

09:54:10 11 Q. What did you do?

09:54:11 12 A. So -- so this specification talks about what needs to  
09:54:16 13 be done. But as a chip engineer, as I said before, we  
09:54:20 14 are --

09:54:21 15 MR. SHEASBY: Your Honor, I object. At this point  
09:54:24 16 it appears that this witness is attempting to explain  
09:54:26 17 whether Intel did something different from the  
09:54:30 18 specification or not. That's an area of expert testimony.  
09:54:33 19 I have no objection whatsoever from him describing what  
09:54:37 20 his -- what he did do, but comparing what he did do to the  
09:54:42 21 standard document, is expert testimony.

09:54:44 22 THE COURT: Is there a response?

09:54:46 23 MR. SUMMERSGILL: Your Honor, that's not what  
09:54:47 24 we're trying to do, but I can ask another question to make  
09:54:50 25 sure that that doesn't happen.



09:54:51 1 THE COURT: Well, to ensure that there's no risk  
09:54:53 2 of that happening, this being a fact witness and not a  
09:54:56 3 previously-disclosed expert witness, I'll sustain the  
09:54:59 4 objection, but I'll allow you to ask it in a different way.

09:55:03 5 MR. SUMMERSGILL: Thank you, Your Honor.

09:55:04 6 Q. (By Mr. Summersgill) Mr. Ramaprasad, without making  
09:55:07 7 any comparison between what the Intel chips do and what the  
09:55:10 8 standard does, can you tell us what you did to design the  
09:55:16 9 Intel products to operate with this portion of the  
09:55:18 10 standard?

09:55:19 11 A. Sure. So, as I said, complex of things can be done in  
09:55:24 12 simplest of ways.

09:55:25 13 So for this particular section, we used a shift  
09:55:28 14 operation, which does it very efficiently, occupying the  
09:55:33 15 least amount of space on the chip.

09:55:34 16 Q. And would you explain what this shift calculation is  
09:55:37 17 and how it works?

09:55:38 18 A. Sure.

09:55:39 19 Q. And would you like to use your monitor?

09:55:42 20 A. Yeah.

09:55:48 21 So let's take a No. 4, right? The No. 4 on a  
09:55:54 22 computer chip, we usually represent it in terms of 0s and  
09:56:00 23 1s. It looks like 0100, right?

09:56:04 24 So what we do is we can take these digits, the 0s  
09:56:09 25 and 1s, either shift it right or shift it left. In this

09:56:13 1 case, let's say we shift it right. So we use this  
09:56:18 2 operation, two arrow marks pointing right. So this bit  
09:56:22 3 falls off, this one comes over here, this one comes over  
09:56:25 4 here, and this one comes over here.

09:56:30 5 So this is nothing but a 2 on the computer. So a  
09:56:35 6 4, when it's right-shifted by one position, becomes a 2.  
09:56:41 7 So that's the simplest of operations we perform.

09:56:44 8 Q. Now, Mr. Ramaprasad, how do you know that the Intel  
09:56:49 9 chips in the Apple products use this shift calculation?

09:56:52 10 A. I know because I have used it in my source code.

09:56:54 11 Q. And by "used it" in your source code, you mean you  
09:56:58 12 helped to write the source code?

09:56:59 13 A. Yeah, I did. That's what I meant, yeah.

09:57:02 14 MR. SUMMERSE GILL: Your Honor, may we seal the  
09:57:04 15 courtroom? And -- and I'm going to present Apple  
09:57:07 16 confidential information, so the Apple folks can remain.

09:57:11 17 THE COURT: All right. Then based on counsel's  
09:57:13 18 request, I'll order the courtroom sealed. Those persons  
09:57:17 19 present not subject to the protective order in this case or  
09:57:19 20 aligned with Defendant, Apple, should excuse themselves  
09:57:23 21 until the courtroom is reopened and unsealed.

09:57:28 22 MR. SHEASBY: Your Honor, I see one person who I  
09:57:30 23 haven't noticed before.

09:57:31 24 Sir, are you under the protective order?

09:57:34 25 PanOptis is in compliance, Your Honor.

09:57:36 1 THE COURT: All right.

09:57:37 2 (Courtroom sealed.)

09:57:37 3 (This portion of the transcript is sealed

09:57:37 4 and filed under separate cover as

09:57:39 5 Sealed Portion No. 15.)

09:57:39 6 (Courtroom unsealed.)

10:02:27 7 THE COURT: Having unsealed the courtroom -- yes,

10:02:30 8 Mr. Mueller.

10:02:30 9 MR. MUELLER: May Mr. Ramaprasad be released, Your

10:02:34 10 Honor?

10:02:34 11 THE COURT: Is there any objection?

10:02:35 12 MR. SHEASBY: No objection at all.

10:02:37 13 THE COURT: The witness is excused.

10:02:38 14 All right. Ladies and gentlemen, this is a good

10:02:41 15 place in time for us to take a short recess. If you will

10:02:44 16 simply close your notebooks and leave them in your chairs.

10:02:47 17 Follow all my instructions, including not to discuss the

10:02:50 18 case among yourself. And we'll be back shortly to

10:02:54 19 continue.

10:02:54 20 The jury is excused for recess at this time.

10:03:01 21 COURT SECURITY OFFICER: All rise.

10:03:02 22 (Jury out.)

10:03:25 23 THE COURT: All right. Counsel, for your

10:03:26 24 information, it appears that we've used an hour and 26

10:03:30 25 minutes so far today.

10:03:35 1 For the entirety of the trial, the Plaintiff has  
10:03:38 2 used 10 hours and 54 minutes. Has 2 hours and 6 minutes  
10:03:42 3 remaining.

10:03:43 4 And Defendants used just a couple seconds short of  
10:03:48 5 11 hours, with two hours remaining.

10:03:50 6 We stand in recess.

10:16:40 7 COURT SECURITY OFFICER: All rise.

10:16:41 8 (Recess.)

10:16:42 9 (Jury out.)

10:16:42 10 COURT SECURITY OFFICER: All rise.

10:16:43 11 THE COURT: Be seated, please.

10:41:30 12 All right. Defendant, are you prepared to call  
10:41:34 13 your next witness?

10:41:35 14 MR. MUELLER: We are, Your Honor. We're going to  
10:41:37 15 call Mr. Mark Lanning, and Mr. Summersgill will do the  
10:41:40 16 examination.

10:42:06 17 (Jury in.)

10:42:07 18 THE COURT: Welcome back, ladies and gentlemen.  
10:42:09 19 Please have a seat.

10:42:10 20 Defendant, call your next witness.

10:42:14 21 MR. MUELLER: Thank you, Your Honor. We call  
10:42:15 22 Mr. Mark Lanning.

10:42:17 23 THE COURT: All right. Mr. Lanning, if you'll  
10:42:19 24 come forward and be sworn.

10:42:21 25 (Witness sworn.)

10:42:34 1 THE COURT: Please come around, sir, have a seat  
10:42:39 2 at the witness stand.

10:42:41 3 All right. Mr. Summersgill, you may proceed with  
10:42:56 4 your direct examination.

10:42:58 5 MR. MUELLER: Thank you, Your Honor.

10:42:58 6 MARK LANNING, DEFENDANT'S WITNESS, SWORN

10:42:58 7 DIRECT EXAMINATION

10:42:58 8 BY SUMMERSGILL:

10:43:00 9 Q. Mr. Lanning, could you please introduce yourself, and  
10:43:03 10 tell the jury a little bit about yourself?

10:43:05 11 A. Good morning, ladies and gentlemen. As you probably  
10:43:07 12 just heard, my name is Mark Lanning. I live with my wife  
10:43:12 13 in Greenville, Texas, where we have a ranch called the  
10:43:18 14 Twisted L Ranch where we raise Paint and Quarter horses,  
10:43:23 15 and we raise Grade 1 cattle and Hereford cattle and cross  
10:43:27 16 those two cattle together. Recently, we also adopted 30  
10:43:27 17 wild Mustangs to give them a better home and to keep things  
10:43:33 18 interesting at the ranch.

10:43:33 19 THE COURT: Mr. Lanning, would you pull the  
10:43:37 20 microphone closer to you, please, sir?

10:43:37 21 THE WITNESS: Yes, Your Honor.

10:43:37 22 THE COURT: Thank you.

10:43:41 23 THE WITNESS: And I want to say, too, is I realize  
10:43:43 24 this is your fifth day here in court, and I promise that I  
10:43:46 25 won't take any more of your time today than absolutely

10:43:49 1 necessary to cover the points I need to.

10:43:53 2 Q. (By Mr. Summersgill) What do you do for a -- a living,  
10:43:56 3 Mr. Lanning?

10:43:56 4 A. Well, when I don't have my boots on, I do technical  
10:44:03 5 work. I do technical consulting. A lot of that consulting  
10:44:05 6 is in regard to wireless and cellular networks.

10:44:07 7 Q. And for how long you have been working in the area of  
10:44:11 8 wireless communication technologies?

10:44:12 9 A. I started working in cellular networks over 35 years  
10:44:18 10 ago when cellular networks were just invented, the  
10:44:20 11 first-generation networks. For some of you old enough to  
10:44:26 12 realize, the phones then were as big as a big purse. We  
10:44:29 13 called it a bag phone. And all the phone could do was just  
10:44:32 14 barely make calls and receive calls.

10:44:35 15 And since then, I've been building products for  
10:44:39 16 generation 2 networks, generation 3 cellular networks, and  
10:44:43 17 I've also been architect of the largest generation 2  
10:44:48 18 cellular network in the world, and -- where we rolled out  
10:44:52 19 over a billion dollars worth of cellular equipment to  
10:44:55 20 achieve that.

10:44:55 21 Q. Where did you go to school, Mr. Lanning?

10:44:58 22 A. I went to school at Southern Methodist University in  
10:45:00 23 Dallas.

10:45:02 24 Q. And tell me, where did you begin your career?

10:45:05 25 A. I -- I began my -- began my career in 1974 when I

10:45:12 1 joined the U.S. Army Signal Corp. And I picked something  
10:45:17 2 that was a long class that said Fixed Cycling Repair. I  
10:45:25 3 had no idea what that was. Turns out that it was encrypted  
10:45:27 4 communications that the military uses to encrypt all of  
10:45:29 5 their data and voice communications between all their  
10:45:34 6 different installations and soldiers in the field.

10:45:36 7 Q. And what did you work on in the Army with relation to  
10:45:42 8 the White House?

10:45:42 9 A. After two years going to intensive classes and  
10:45:47 10 achieving the top graduate award in three of these  
10:45:50 11 different classes, I was asked to be a member of a small  
10:45:52 12 team that was responsible for upgrading the White House  
10:45:56 13 communications throughout the world. And so we upgraded  
10:45:59 14 all the communications equipment in the White House for all  
10:46:03 15 of their voice and data so that all of that would be  
10:46:06 16 secure.

10:46:07 17 Q. And what did you do after you left the Army,  
10:46:10 18 Mr. Lanning?

10:46:10 19 A. After I left the Army, I -- I took a job with a company  
10:46:15 20 called International Telephone and Telegraph where I worked  
10:46:18 21 for them full time on the first email system that was  
10:46:25 22 built, and I went to school full time, like -- like I said,  
10:46:28 23 at SMU in Dallas at that time.

10:46:30 24 Q. And when did you start consulting?

10:46:32 25 A. I started consulting in 1991.

10:46:35 1 Q. And has all of your consulting involved litigation?

10:46:38 2 A. No. For the first 15 years, I did pure consulting for  
10:46:47 3 design of software and hardware systems, and the majority  
10:46:50 4 of that design was for cellular equipment.

10:46:53 5 After the first 15 years, then I started slowly  
10:46:56 6 working into the type of work I'm doing today, which is  
10:47:00 7 legal-type expert work.

10:47:02 8 Q. And have you designed any wireless products?

10:47:05 9 A. Yes, I've de -- designed many wireless products that  
10:47:09 10 are still being used today for cellular networks. I  
10:47:17 11 designed and worked with Motorola on a state-of-the-art  
10:47:20 12 base station that they were building that they've sold  
10:47:23 13 hundreds of, probably thousands by now, all over the world.

10:47:26 14 I've also co-designed cell phones with Nokia, and  
10:47:30 15 a lot of the other cellular equipment that really hadn't --  
10:47:33 16 hasn't been addressed in this trial that -- that's in a  
10:47:36 17 cellular network.

10:47:37 18 Q. Do you have any experience with computer code?

10:47:40 19 A. Yes, I do. I -- seems like thinking back it was like  
10:47:46 20 we were doing it with a stone tablet and a chisel, but I  
10:47:50 21 started writing software back in 1975. It's, again, like  
10:47:54 22 many things, a lot different.

10:47:57 23 Since then, I've written over a million lines of  
10:48:00 24 software code in various languages. And some examples are  
10:48:04 25 microcode, assembler, Fortran, Pascal, C, C++. I've also



10:48:12 1 designed hardware using the hardware design language for a  
10:48:16 2 computer processor and another chip that's similar to the  
10:48:20 3 baseband chips that you've heard of that we call the high  
10:48:23 4 speed data rate chip.

10:48:26 5 THE COURT: Mr. Lanning, I'm going to ask you to  
10:48:29 6 limit your answers to the questions asked. He asked if you  
10:48:32 7 had experience with computer code, not about designing  
10:48:32 8 hardware, not about all that other stuff. If he wants to  
10:48:35 9 know more than what your -- his question calls for, he'll  
10:48:39 10 ask you a second question. Is that understood, sir?

10:48:42 11 THE WITNESS: Yes, yes, Your Honor.

10:48:43 12 THE COURT: Thank you very much.

10:48:44 13 Please continue.

10:48:46 14 Q. (By Mr. Summersgill) Mr. Lanning, what experience, if  
10:48:48 15 any, do you have with the LTE standard?

10:48:51 16 A. I have extensive experience with the LTE standard.

10:48:55 17 Q. And what is that experience, briefly?

10:48:57 18 A. Well, the LTE standard didn't just start with the blank  
10:49:02 19 piece of paper. As I described, I started with the first  
10:49:04 20 generation cellular networks, and I've worked on standards  
10:49:07 21 for those networks.

10:49:08 22 I've worked also with the second generation  
10:49:10 23 networks and the third generation networks.

10:49:13 24 So a majority of that functionality has been  
10:49:15 25 adopted by the fourth generation LTE network.

10:49:19 1 And then I also keep up with the LTE standard  
10:49:22 2 because it isn't fixed in place. There's a new release  
10:49:27 3 that comes out typically each year. So I need to stay up  
10:49:31 4 with that.

10:49:31 5 Q. And for how many different companies would you say that  
10:49:33 6 you provided expert consulting services?

10:49:37 7 A. I've provided expert consulting services for over 60  
10:49:42 8 different companies besides Apple.

10:49:45 9 Q. And have you provided expert consulting services to  
10:49:48 10 Apple in the past?

10:49:49 11 A. Yes, I have.

10:49:50 12 Q. And how much have you been paid Apple for those  
10:49:52 13 services in the last five years, sir?

10:49:54 14 A. A little under a million dollars.

10:49:57 15 Q. And what's your hourly rate, Mr. Lanning?

10:49:59 16 A. \$550 an hour.

10:50:01 17 Q. Now, Mr. Lanning, does your compensation in this case  
10:50:05 18 or any of the other cases that you've handled depend in any  
10:50:09 19 way on the outcome of the cases?

10:50:10 20 A. No, it doesn't. I'm an independent consultant. I get  
10:50:14 21 paid regardless of the outcome of this case.

10:50:21 22 MR. SUMMERSE GILL: Your Honor, we offer Mr. Lanning  
10:50:23 23 as an expert in the field of wireless communications  
10:50:26 24 technologies.

10:50:26 25 THE COURT: Is there objection?

10:50:28 1 MR. SHEASBY: No objection.

10:50:28 2 THE COURT: Then the Court will recognize this  
10:50:31 3 witness as an expert in those designated fields.

10:50:34 4 Please continue, counsel.

10:50:35 5 MR. SUMMERSGILL: Thank you, Your Honor.

10:50:36 6 Q. (By Mr. Summersgill) Mr. Lanning, what were you asked  
10:50:37 7 to do in this case?

10:50:39 8 A. I was asked to provide opinions for two patents that  
10:50:43 9 you've already seen. They are the '557 and the '332  
10:50:47 10 patents. Specifically, my opinions were in regard to  
10:50:51 11 Apple's infringement of these patents and also whether  
10:50:53 12 these patents were valid or not.

10:50:55 13 Q. And how did you go about your investigation?

10:50:57 14 A. I provided many, many hundreds of hours of analysis,  
10:51:04 15 and I go about my investigation typically, like this one, I  
10:51:07 16 start with the patents. I start with their file histories.  
10:51:10 17 I start with the Court's constructions to make sure I  
10:51:14 18 understand how I should read the claims of the patents.

10:51:19 19 Then I look at a lot of different documents and  
10:51:21 20 information. There's Apple documents. There's many  
10:51:26 21 different documents.

10:51:27 22 And then I also spent many hours evaluating the  
10:51:32 23 software source code and the hardware source code for the  
10:51:38 24 Intel and Qualcomm baseband chips that are used in the  
10:51:44 25 Apple products.

10:51:45 1 Q. And why did you review the source code?

10:51:47 2 A. Well, the source code -- reviewing the source code for  
10:51:50 3 the software and the hardware is the only way you really  
10:51:55 4 know what that chip is doing. The software tells the  
10:51:59 5 hardware what to do, and the hardware design document shows  
10:52:04 6 how all the circuitry is put together and all the timing  
10:52:06 7 for the hardware.

10:52:08 8 So without studying the software code for the --  
10:52:14 9 source code for the software and the hardware, one really  
10:52:18 10 doesn't know what that chip is doing for sure.

10:52:20 11 Q. And did you speak to any of the Apple engineers in  
10:52:26 12 connection with your analysis?

10:52:27 13 A. Yes, I did. And you've heard the two that I spoke to  
10:52:32 14 testify, Dr. Josiam and Mr. Ramaprasad, who just finished  
10:52:35 15 testifying.

10:52:36 16 Q. And why did you speak to the two Apple engineers?

10:52:38 17 A. I performed many hours of analysis, and I wanted to  
10:52:42 18 confirm that my understanding of my review of the software  
10:52:46 19 source code and the hardware operated the way it did, and I  
10:52:49 20 confirmed with them.

10:52:50 21 I also wanted to talk to them to understand some  
10:52:53 22 of the reasons why their teams chose to do it the way the  
10:52:59 23 chips did.

10:53:00 24 Q. May I ask now you some questions about your analysis of  
10:53:02 25 the '557 patent?

10:53:02 1 A. Sure.

10:53:03 2 Q. So at a high level, what's the subject matter of the  
10:53:06 3 '557 patent?

10:53:06 4 A. And you've heard this acronym before. It's about a  
10:53:10 5 part of the random access procedure. Specifically, what  
10:53:13 6 we're talking about this week is the mobile device, like a  
10:53:18 7 cell phone, would send a sequence to the base station.

10:53:22 8 It's called a random access procedure because the  
10:53:26 9 base station doesn't know the cell phone's in its area  
10:53:30 10 until the cell phone contacts it and say: Hey, I'm here,  
10:53:35 11 and I want to establish a connection.

10:53:37 12 Q. And what is this random access procedure used for?

10:53:40 13 A. Again, when you turn on a cell phone or if you're on an  
10:53:45 14 airplane and take it off of airplane mode, the cell phone  
10:53:49 15 needs to find the closest cell that it gets the strongest  
10:53:54 16 signal.

10:53:54 17 Now, when it does that, again, the base station  
10:53:56 18 doesn't know that cell phone is there. So the random  
10:53:59 19 access procedure is used by the cell phone to contact the  
10:54:02 20 base station and see if it can establish a connection with  
10:54:06 21 that base station.

10:54:07 22 Q. Mr. Lanning, have you helped prepare any demonstratives  
10:54:10 23 to help explain this random access procedure?

10:54:13 24 A. Yes, I have.

10:54:14 25 MR. SUMMERSGILL: Could we please pull up DDX-5

10:54:17 1 .3?

10:54:18 2 Q. (By Mr. Summersgill) And with reference to that,  
10:54:20 3 Mr. Lanning, could you explain to the jury how this process  
10:54:23 4 works.

10:54:23 5 A. What you see on the right is the base station. And  
10:54:28 6 what we refer to a base station, you may see towers like  
10:54:32 7 this around, and these are the base station towers.

10:54:34 8 What I'm showing on the left is a typical cell  
10:54:37 9 phone. And the words you see in the cell phone, if you  
10:54:40 10 can't read them, say: Searching for service.

10:54:44 11 Once it finds the signal from the base station, it  
10:54:47 12 then sends a sequence -- next slide -- over to the base  
10:54:52 13 station. And what I put in the box is: Hi, can I make a  
10:54:56 14 connection with you?

10:54:56 15 If the base station agrees, then a connection is  
10:55:01 16 established.

10:55:02 17 The next step, please.

10:55:03 18 And what I'm showing by this slide is there's a  
10:55:08 19 connection established, and when that occurs, typically is  
10:55:11 20 when you see those bars of service, the different levels  
10:55:14 21 based on the strength of the signal it's receiving.

10:55:17 22 Q. And what is a sequence?

10:55:19 23 A. A sequence is a specific order of values, and we refer  
10:55:26 24 to them as complex values because they typically refer to  
10:55:30 25 different angles.

10:55:32 1 And in this case, for LTE, the sequence is a large  
10:55:37 2 number of values, 839, that are sent, and it's a unique  
10:55:43 3 order that the base station understands.

10:55:45 4 MR. SUMMERSGILL: Could we please pull up DDX-5.6?

10:55:50 5 Q. (By Mr. Summersgill) And, Mr. Lanning, can you explain  
10:55:53 6 what's shown on DDX-5.6?

10:55:56 7 A. I -- you see the numbers going across. This represents  
10:56:05 8 one sequence. So the sequence I was referring to, this is  
10:56:08 9 what's sent from the mobile device, like a cell phone, to  
10:56:11 10 the base station. And as you see the little circle for  
10:56:17 11 degrees, these are all different angles. And the order of  
10:56:21 12 where all these numbers are at is important because that's  
10:56:24 13 the value of a specific sequence.

10:56:25 14 Q. And how many sequences can each base station understand  
10:56:30 15 in this process?

10:56:31 16 A. Each base station in an LTE network uses 64 unique  
10:56:37 17 sequences that have -- these sequences of this type that  
10:56:42 18 have different patterns or different combinations of these  
10:56:46 19 numbers.

10:56:46 20 Q. And when were random access procedures first developed?

10:56:50 21 A. Random access procedures have been required in cell  
10:56:54 22 phones and cellular networks since cellular networks, for  
10:56:57 23 the reasons I stated.

10:57:00 24 So I worked on C -- random -- the random access  
10:57:04 25 procedure since the early 1900s, in second-generation

10:57:08 1 cellular networks. They were needed in third-generation  
10:57:12 2 cellular networks. And, likewise, they're needed in LTE  
10:57:18 3 fourth-generation networks.

10:57:19 4 Q. And how, if at all, did mobile devices generate and use  
10:57:24 5 sequences before the '557 patent?

10:57:26 6 A. There are many different kinds of sequences that have  
10:57:28 7 been used by cell phones and different length of sequences  
10:57:31 8 that they're generated, and they've been used in different  
10:57:34 9 ways for the same type of random access procedure.

10:57:37 10 Q. Now, what is the '557 patent claim with respect to the  
10:57:41 11 use of these sequences in the random access process you --  
10:57:45 12 you described?

10:57:46 13 A. The '557 patent claims we're going to discuss today  
10:57:52 14 require specific things be done for the sequences, that the  
10:57:56 15 sequences be generated from a plurality of base sequences,  
10:58:03 16 meaning more than one. And the plurality of sequences need  
10:58:07 17 to be generated, which means more of them need to be  
10:58:10 18 generated. And after they're generated, then the cell  
10:58:14 19 phone needs to randomly select one of these sequences that  
10:58:17 20 it's going to send to the base station.

10:58:20 21 MR. SUMMERSGILL: Can we please pull up D -- pull  
10:58:22 22 up DTX-27?

10:58:26 23 Q. (By Mr. Summersgill) What is this, Mr. Lanning?

10:58:28 24 A. This is the '557 patent, the front page of it.

10:58:30 25 MR. SUMMERSGILL: And could we turn to Page 18 and



10:58:32 1 Claim 1?

10:58:33 2 Q. (By Mr. Summersgill) Mr. Lanning, what does Claim 1  
10:58:35 3 require?

10:58:35 4 A. You have seen Claim 1 before, and it's got -- it has a  
10:58:40 5 lot of words and multiple requirements. But what I'd like  
10:58:45 6 to focus you on today is the second requirement that begins  
10:58:49 7 with: A selecting unit configured to randomly select a  
10:58:52 8 sequence from a plurality of sequences contained in one  
10:58:57 9 group of a plurality of groups, into which a pre-determined  
10:59:03 10 number of sequences that are generated from a plurality of  
10:59:11 11 base stations -- sorry -- a plurality of base sequences.

10:59:14 12 MR. SUMMERSGILL: Now, could we turn to Claim 10  
10:59:16 13 of the '557 patent, please?

10:59:18 14 Q. (By Mr. Summersgill) And could you explain what  
10:59:24 15 Claim 10 requires.

10:59:25 16 A. Claim 10 is a different type of claim that's referred  
10:59:28 17 to as a method claim, but the same requirements I just read  
10:59:31 18 you for Claim 1 are also in Claim 10.

10:59:34 19 Specifically, starting with grouping a  
10:59:37 20 pre-determined number of sequences that are generated from  
10:59:42 21 a plurality of sequences. And then if I go down to the  
10:59:46 22 next requirement, randomly selecting a sequence from a  
10:59:52 23 plurality of sequences contained in one group of the  
10:59:56 24 plurality of groups.

10:59:56 25 Q. Now, Mr. Lanning, what part within the Apple products

11:00:02 1 contains the functionality at issue?

11:00:04 2 A. The Apple products have a specialized piece of hardware  
11:00:10 3 in the baseband chip called a sequence generator.

11:00:14 4 Q. And what do you understand that the Plaintiffs must do  
11:00:16 5 to prove infringement?

11:00:17 6 A. I think you've heard this before, but what is  
11:00:23 7 required -- in order for the Plaintiffs to show  
11:00:25 8 infringement for the claims that I've just read for the  
11:00:29 9 '557 -- or showed you -- they need to show that the Apple  
11:00:34 10 products perform each and every requirement or limitation  
11:00:37 11 of those claims.

11:00:39 12 And what I mean by that is, if Apple shows you or  
11:00:44 13 I show you that one of these requirements is not performed  
11:00:48 14 by the Apple products, then the Apple products don't  
11:00:51 15 infringe.

11:00:51 16 Q. And what conclusion did you reach on the issue of  
11:00:58 17 infringement of Claims 1 and 10 of the '557 patent?

11:01:01 18 A. That the Apple products do not infringe Claims 1 and 10  
11:01:04 19 of the '557 patent.

11:01:04 20 Q. And what's the basis for that conclusion?

11:01:06 21 A. Because the Apple products simply don't do the  
11:01:13 22 functionality required by these claims.

11:01:19 23 First, the Apple products don't generate a group  
11:01:21 24 of basic -- of sequences from at least two base sequences,  
11:01:29 25 like I showed you in the limitation, and they don't select

11:01:32 1 a sequence randomly from those sequences that have been  
11:01:34 2 generated because there's no sequences that have been  
11:01:36 3 generated.

11:01:37 4 Q. Now, Mr. Lanning, what is a base sequence?

11:01:39 5 A. A base sequence is very similar to that -- that whole  
11:01:45 6 slide full of values I showed you with the angles, but it  
11:01:49 7 has a specific -- specific combination of values so that it  
11:01:54 8 can be manipulated, and other sequences can be generated  
11:01:58 9 from it.

11:02:01 10 MR. SUMMERSGILL: And could we please put Claim 1  
11:02:03 11 of the '557 patent back up on the screen.

11:02:06 12 Q. (By Mr. Summersgill) How does the claim -- or how do  
11:02:08 13 the claims describe that sequences are generated?

11:02:11 14 A. Well, first, if I could go down to -- I'm looking  
11:02:16 15 for -- in the middle where it says a -- which: A  
11:02:23 16 pre-determined number of sequences that are generated from  
11:02:25 17 a plurality of base sequences. So the way these sequences  
11:02:33 18 are generated is from at least two base sequences.

11:02:36 19 Q. Now, where in the Intel and Qualcomm baseband chips is  
11:02:40 20 a sequence generated?

11:02:41 21 A. They're generated in the specific type of hardware in  
11:02:51 22 the baseband chip called the sequence generator.

11:02:53 23 Q. And how does the sequence generator of the Intel and  
11:02:56 24 Qualcomm baseband chips generate a sequence?

11:02:58 25 A. The sequence generator is a specialized piece of

11:03:03 1 hardware that's -- that's very sophisticated, and it  
11:03:07 2 receives a value or parameters from the software.

11:03:11 3 Based on the parameters it receives from the  
11:03:13 4 software, it does some complex mathematical comp --  
11:03:19 5 computations to actually generate each value of the  
11:03:22 6 sequence.

11:03:23 7 And as it generates each value of the sequence, it  
11:03:26 8 transmits out to the antenna. And then once that sequence  
11:03:30 9 is generated, it's gone, and the hardware waits until the  
11:03:34 10 next time it needs to -- to send another sequence.

11:03:36 11 Q. Now, how does the process of generating a sequence in  
11:03:41 12 the Intel and Qualcomm chips compare to Claims 1 and 10 of  
11:03:45 13 the '557 patent?

11:03:45 14 A. Well, the Intel and Qualcomm baseband chips, first, do  
11:03:54 15 not generate a plurality of sequences from the base  
11:03:57 16 sequences.

11:03:59 17 Next, they don't select a sequence from these  
11:04:02 18 generated sequences because if they don't generate them in  
11:04:06 19 the first place, there's no sequence to select from.

11:04:09 20 Q. And have you helped prepare some demonstratives to  
11:04:12 21 explain these differences?

11:04:13 22 A. Yes, I have.

11:04:14 23 MR. SUMMERSGILL: Can we please pull up DDX-5.7?

11:04:22 24 Q. (By Mr. Summersgill) And, Mr. Lanning, with respect to  
11:04:24 25 5.7, could you explain what we see here?

11:04:32 1 A. What I'm showing on this slide is the requirement of  
11:04:32 2 the claim that there be a plurality of base sequences, so  
11:04:34 3 I'm showing two base sequences here. On the left is the  
11:04:40 4 red base sequence, and on the blue is the right. And so  
11:04:44 5 sequences need to be generated from at least two of these  
11:04:47 6 base sequences.

11:04:48 7 So next step. Next, please.

11:04:55 8 So I'm showing that the -- the '557 patent  
11:05:00 9 requires that this first base sequence be manipulated so it  
11:05:04 10 generates another sequence. But another sequence is not  
11:05:07 11 enough. It needs to generate a plurality of sequences.

11:05:11 12 And so what I'm going to show you is that the red  
11:05:18 13 base sequence will generate so many sequences until it  
11:05:22 14 can't generate any more from that base sequence. Then it  
11:05:25 15 will go over to the blue base sequence and generate the  
11:05:28 16 remaining sequences that are required.

11:05:30 17 Go ahead. Next slide, please.

11:05:32 18 So what you see here on this slide is I have a  
11:05:37 19 number of sequences in red on the left that have been  
11:05:40 20 generated from the red base sequence, and then the  
11:05:46 21 requirement of the '557 is I need to generate sequences  
11:05:49 22 from at least another base sequence, and I'm showing you  
11:05:53 23 the base sequences on the right.

11:05:55 24 And what I'm showing here is you look, there's a  
11:05:58 25 total of 64 base sequences that would be required to do it

11:06:02 1 the way the '557 patent requires in LTE.

11:06:06 2 Q. And, Mr. Lanning, what you just showed us was on  
11:06:13 3 DDX-5.7 to 5.10, right?

11:06:18 4 A. Yes, sir. I'm sorry. I was taking a drink.

11:06:20 5 Q. Now, you -- you are allowed to drink.

11:06:25 6 What is --

11:06:27 7 MR. SUMMERSGILL: Could we put up DDX-5.11,  
11:06:33 8 please?

11:06:33 9 Q. (By Mr. Summersgill) Mr. Lanning, what does -- what  
11:06:34 10 does DDX-5.11 show?

11:06:36 11 A. Now, I'd like to go down and show you the functionality  
11:06:39 12 that occurs, at a high level, in the baseband chips.

11:06:43 13 The next slide, please.

11:06:45 14 What I'm showing you, and you've seen where  
11:06:48 15 Dr. Josiam actually showed you an iPhone and where that  
11:06:55 16 little baseband chip that does many things is located, and  
11:06:57 17 that's what I'm focusing here on the left with the phone.

11:06:59 18 Q. Mr. Lanning, let me pause you for one second. You're  
11:07:02 19 now talking about the Intel and Qualcomm baseband chips?

11:07:03 20 A. Yes, this would -- this is the Intel/Qualcomm chips or  
11:07:07 21 baseband chips, as I say on the top of this slide. So that  
11:07:11 22 would be the baseband chip, and this is how the Intel and  
11:07:16 23 Qualcomm baseband chips were.

11:07:17 24 And I've broken that up into two pieces on the  
11:07:20 25 right that I've labeled Software and Hardware, because

11:07:23 1 there's two different components that are in those chips.

11:07:29 2 The software, which tells the hardware what to do, and then  
11:07:33 3 the specialized software.

11:07:35 4 The next step.

11:07:36 5 So what happens in the Intel and Qualcomm baseband  
11:07:39 6 chips, they choose a value at random. I've just chosen a  
11:07:45 7 value at random for 37. And using that value, then the  
11:07:49 8 software sends some parameters down to the specialized  
11:07:54 9 sequence generator in the hardware, and I'll represent this  
11:07:57 10 specialized hardware, you'll see these sprockets turning at  
11:08:03 11 the bottom.

11:08:03 12 Next step.

11:08:04 13 And so once that parameter goes down, then the  
11:08:09 14 hardware generates each of those different angles for that  
11:08:13 15 sequence, and as they're generated, they're transmitted out  
11:08:16 16 to the antenna, and the sequence is not stored anywhere.

11:08:19 17 Q. Now, could you tell the jury why the chips are designed  
11:08:22 18 that way?

11:08:22 19 A. The chips -- the chips are designed that way because  
11:08:27 20 it's much more efficient, and there's a lot of pressure on  
11:08:30 21 the baseband chips to be as efficient as they can be.

11:08:34 22 Q. And how do you know that the baseband chips in the  
11:08:37 23 Apple products operate in the way you just described?

11:08:39 24 A. Well, first, I spent many hours evaluating the software  
11:08:45 25 part that you see on the top of the screen for both the

11:08:47 1 Intel and Qualcomm baseband chips. I also spent many hours  
11:08:53 2 reviewing the circuitry of the hardware, and specifically  
11:08:58 3 this hardware sequence generator of the Intel and Qualcomm  
11:09:02 4 chips.

11:09:03 5 And it's like I mentioned before, that's the only  
11:09:05 6 way an engineer or anyone else would know how these  
11:09:08 7 baseband chips operate.

11:09:09 8 Q. Now, Mr. Lanning, why specifically did you review the  
11:09:13 9 hardware source code?

11:09:15 10 A. Because I wanted to verify that the hardware wasn't  
11:09:20 11 doing any generation of a base sequence, it wasn't  
11:09:24 12 generating other sequences from base sequences, and it  
11:09:28 13 wasn't randomly selecting a sequence from the -- these  
11:09:34 14 plurality or a group of sequences. Then I confirmed that  
11:09:39 15 it -- based on what I would see in the hard -- the  
11:09:43 16 software, that's what the hardware was doing.

11:09:44 17 MR. SUMMERSGILL: Your Honor, may we seal the  
11:09:46 18 courtroom?

11:09:46 19 THE COURT: Based on counsel's request, I'll order  
11:09:49 20 the courtroom sealed at this time. Those present not  
11:09:53 21 subject to the protective order that's been entered in this  
11:09:57 22 case --

11:09:58 23 MR. SUMMERSGILL: And -- and, Your Honor, I will  
11:10:00 24 be showing Apple confidential information.

11:10:02 25 THE COURT: -- or otherwise aligned with Defendant



11:10:05 1 Apple should excuse themselves until the courtroom is  
11:10:09 2 reopened and unsealed.

11:10:14 3 (Courtroom sealed.)

11:10:14 4 (This portion of the transcript is sealed  
11:10:14 5 and filed under separate cover as  
11:10:14 6 Sealed Portion No. 16.)

12:07:21 7 (Courtroom unsealed.)

12:07:21 8 THE COURT: Ladies and gentlemen, we're going to  
12:07:23 9 recess for lunch at this time. Please take your notebooks  
12:07:25 10 with you to the jury room. Please enjoy the lunch that's  
12:07:28 11 been provided for you there.

12:07:30 12 Please follow all my instructions, including not  
12:07:32 13 to discuss the case among yourself or communicate about it  
12:07:36 14 in any other way.

12:07:38 15 It's about seven or eight minutes after 12:00.  
12:07:41 16 We'll try to convene about that same time after 1:00.

12:07:46 17 With that, the jury is excused for lunch.

12:07:50 18 COURT SECURITY OFFICER: All rise.

12:07:53 19 (Jury out.)

12:08:11 20 THE COURT: Be seated.

12:08:12 21 As of right now, according to my calculations, the  
12:08:15 22 Plaintiffs have 1 hour and 54 minutes remaining.

12:08:19 23 The Defendant has 51 minutes on your allocated  
12:08:22 24 trial time remaining.

12:08:24 25 We'll attempt to reconvene as close to 1:00

12:08:27 1 o'clock as possible.

12:08:28 2 Mr. Mueller, you're on your feet. Do you have  
12:08:30 3 something for the Court?

12:08:32 4 MR. MUELLER: I do, Your Honor. May Mr. Lanning  
12:08:34 5 be released?

12:08:35 6 THE COURT: Any objections?

12:08:36 7 MR. SHEASBY: No objections.

12:08:37 8 THE COURT: Mr. Lanning is excused.

12:08:39 9 Any further before we recess for lunch?

12:08:42 10 MR. SHEASBY: Nothing from Plaintiffs, Your Honor.

12:08:45 11 MR. MUELLER: No, Your Honor.

12:08:45 12 THE COURT: We stand in recess.

12:08:48 13 COURT SECURITY OFFICER: All rise.

12:08:48 14 (Recess.)  
15

16 CERTIFICATION

17 I HEREBY CERTIFY that the foregoing is a true and  
18 correct transcript from the stenographic notes of the  
19 proceedings in the above-entitled matter to the best of my  
20 ability.  
21

22 /S/ Shelly Holmes  
23 SHELLY HOLMES, CSR, TCRR  
24 OFFICIAL REPORTER  
State of Texas No.: 7804  
Expiration Date: 12/31/20  
25

8/7/2020  
Date